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ABSTRACT

This report is concerned with the development of a model for projecting instructional activity and its application within The Pennsylvania State University. Inasmuch as models of this type have been developed at a number of institutions of higher education, the effort described in this report does not constitute an extension of fundamental knowledge but an application of existing principles to a unique situation involving an institutional system of unusually great size. Explicit in the basis of the model are tenets that there exists for the average student enrolled at each academic level in each major program of study (1) a value of demand for instructional activity representing the summation of the instructional activities for all courses for which he is registered, and (2) a fractional distribution of this demand among the organizational units providing instruction. When a forecast of enrollment is supplied as input to such a model, the output constitutes a projection of instructional activity for the same period of time. (Author)

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A MODEL FOR PROJECTION OF INSTRUCTIONAL ACTIVITY IN A MULTI-CAMPUS UNIVERSITY

B. M. Tallman and R. D. Newton

July 1, 1973

Operations Research
Office of Budget and Planning
The Pennsylvania State University
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I: SUMMARY

In an institution of higher education the demands for instructional services are imposed by virtue of students at various academic levels enrolling in major fields of specialization. However, in order to determine the impact upon the units into which the faculty are organized on the basis of commonality of expertise for purposes of instruction, the enrollment must be translated into instructional activities, measured on some institutionally-common basis such as student credit hours.

This report is concerned with the development of a model — designated as IA-2 — for projecting instructional activity and its application within The Pennsylvania State University. Explicit in the basis of the model are tenets that there exists for the average student enrolled at each academic level in each major program of study (1) a value of demand for instructional activity representing the summation of the instructional activities for all courses for which he is registered and (2) a fractional distribution of this demand among the organizational units providing instruction. When a forecast of enrollment is supplied as input to such a model, the output constitutes a projection of instructional activity for the same period of time.

Inasmuch as each measure of instructional activity is identified in terms of the characteristics of both the consuming student-group and the producing faculty organization unit, both historical and projected results may be portrayed in a great variety of ways. For example, it is possible to show (1) how the production by <u>one</u> college is distributed for consumption among students enrolled for majors in each of the colleges and conversely (2) how the consumption

by students enrolled in one college is met by production in each of the colleges.

Conceptually, models of this type are not new but have been developed for application at a number of institutions of higher education. Consequently, the effort described in this report does not constitute an extension of fundamental knowledge but an application of existing principles to a unique situation involving an institutional system of unusually great size. The work was conducted principally between June and November 1972. It has resulted in a system which, utilizing the existing records of the University and the facilities of the Computation Center, is capable of producing historical tabulations of instructional activity for each campus, college, and department within a few days after the closure of a term at a cost of less than $300 per year, and, given a forecast of enrollment, of generating projections of a like composition at a cost of $25 per run for a single year. The projections one year into the future are accurate within 0.7% when measured on a system-wide total production basis and within 2.5% when the sum of the absolute differences between actual and projected values for each administrative division is expressed as a percent of total production.

In practice the model may serve several purposes. First, and perhaps even paramount, it provides a great deal of understanding concerning the interrelationships between enrollment and instructional activity and the importance of the variables affecting operation. Secondly, it generates information which is of direct use in existing or innovative administrative procedures. And lastly, it may ultimately serve as an essential part of a total simulation model of the University.

II: INTRODUCTION

In an educational institution the members of the faculty are aggregated usually on the basis of similar orientation into organizations such as departments, schools, or colleges. Each of these units provides instruction to students within the area of knowledge comprising its faculty members' expertise. In addition, students enroll in these units in accord with their major programs of study. However, the curriculum specified by the faculty of a given organizational unit for any one program will require that a student register for courses not only within the academic unit in which he is enrolled for guidance of his major program but in others of the institution as well. Because of the interrelationships, a change in the enrollment or curriculum of one organizational unit may have a significant effect upon the magnitude and subject composition of the teaching load, or instructional activity, of another. Without full knowledge of the effect of the interdependencies within an institution it is difficult — if not impossible — for a single academic organizational unit to predict its instructional activity with any degree of accuracy. And without such a forecast, it follows that resources cannot be allocated in an efficient manner.

Research endeavors concerning the interrelationship of students and instructional activity are certainly not new. Early work, as represented by studies conducted by S. Suslow (18) and N. Olsonski (16), involved categorizing students by commonality of academic characteristics and then relating them to the courses taught by various faculty. Other investigators, such as D. F. Lawson and F. I. Jewett (11), R. C. Koza (10), D. L. Raphael (17),

and L. P. Nordell (15) conceived these interdependencies within the context of input-output analysis, as initially advanced in application to economic systems by W. W. Leontief (12). Notably some, G. B. Weathersby (19), H. E. Koenig et al. (9), and R. W. Judy and J. B. Levine (8), perceived the application within the design of large-scale systems to relate demand and resources within educational institutions, as did a later application by the National Center for Higher Education Management Systems (6).

At The Pennsylvania State University research efforts concerning the interdependence of activities in an educational institution date back to 1966, when D. L. Raphael (17) established the feasibility of using input-output analysis to describe monetary, personnel, and instructional flows. In a continuation of one aspect of this study, T. K. Bennett (2) suggested in 1968 that an input-output model of instructional activity might be employed for projection of future activities. Building upon this hypothesis, an aggregated model for pilot use was developed in 1969 by R. D. Newton (13) and extended for application purposes in 1970 by E. E. Enscore et al. (4,14). However, this model, designated at the time as IA-1, was viewed in light of the then rapidly emerging need for output in a more highly disaggregated form as potentially inefficient for routine application in an expanded mode. The current effort, leading to the development of IA-2, as described in this report, was directed toward surmounting these difficulties within the limitations of existing record systems to provide an efficient vehicle for producing both historical measurements and projections of instructional activity in a detailed form, but within a structure amenable to modification to meet unforseen needs arising in the future. As such, the project does not constitute a further expansion of fundamental knowledge but an application based upon established tenets.

Needless to say, through the process of evolutionary development the above mentioned parties have contributed to whatever application success the present model may enjoy. Additionally, the contribution of A. W. Tyson should be recognized, since throughout these endeavors it was his frequent and patient counsel concerning the implications of various operational idiosyncrasies, which enabled the development of a model incorporating a degree of realism otherwise not attainable.

III: CONCEPTUALIZATION

In the introduction to this report, it was observed in an institution of higher education

> *that interdependencies exist between the major-program composition of enrollment and the subject-matter composition of instructional activity.*

In this chapter, it will be shown how these relationships may be conceptually formulated and then explicitly defined and measured for use in a model for projecting instructional activity in the future.

An instructional activity model may be defined as a set of relationships by which the enrollment of students in an institution of higher education may be translated into the demand for instructional services provided by the faculty, where this demand is measured in terms of student credit hours, semester credits, etc. When a forecast of enrollment is supplied as an input to such a model, the output constitutes a projection of instructional activity production for the same time frame.

IDEALIZED CONCEPT

Students enrolled in a college or university may be categorized into common groups, in accord with some measure of their level of academic progression — first year, second year, etc. and baccalaureate, graduate, etc. — within their major programs of study — liberal arts, law, engineering, etc. — in the institution. From an idealized view, there exists a curriculum of courses related to each level within every major program. Theoretically a

student at a particular level in a major registers for the appropriate courses specified in the overall curriculum, and thus, given the enrollment of students at the identical level in the same major, the demand can be ascertained for specific courses encompassed by the appropriate curriculum. Furthermore, knowing the suitably categorized enrollments of all students, an assessment may be made of the demands for all courses. Once these demands are determined, they may then be aggregated in accord with commonality of subject-matter to generate an appraisal of the instructional activity required of each academic organizational unit to meet the overall demands imposed by all students enrolled in the institution.

MODEL FORMULATION

Unfortunately, the idealized view differs from the situation which currently exists in the great preponderance of institutions of higher education. Although a student enrolled for a particular major is required to complete the appropriate composition of courses comprising the curriculum applicable to his major program, he generally is permitted some degree of latitude within the progression of academic levels as to when he registers for some courses and indeed he is frequently offered choices in courses toward meeting certain requirements. Thus for most educational institutions, the curricula specified in the catalog would be an inappropriate data source upon which to build relationships between students and instructional activity. For such a purpose a vehicle which reflects the actual exercise of student preferences is needed.

One such record source, which reflects the historical impact of student choices, is comprised of the transcripts which are universally maintained by educational institutions. In addition to noting a student's major and level, transcripts customarily contain an itemization of the courses for which a student was registered at each time interval in his collegiate career. From

an accumulation of transcripts containing the records of all students enrolled in a specific term or semester, it is possible to determine:

1. the enrollments of students suitably categorized by academic levels within majors;
2. the instructional activity — expressed as student credit hours, semester credits, or some other measure of commonality used throughout the institution — consumed by all students in each common category; and
3. the distribution of the instructional activity consumed by the group of students in each category among the subject-matter areas and course-levels of instruction provided by each academic organizational unit.

The instructional system of an educational institution may be viewed as a series of interconnected flows of activities. The demand is initiated by students enrolling at different academic levels in the various major programs of study offered by the institution. To satisfy the requirements of his program, the student will register for courses in which instruction is supplied by various organizational units. Consequently, the flow at this point is fractured into discrete parts in accord with subject-matter composition, and these components, aggregated over common subject-matter, determine the supply of instructional activity which must be provided. Since no accumulation of activities is permitted, consumption, which is a measure of demand, must equal production, the measure of supply.

For illustrative purposes, a hypothetical example has been devised to show how data of the type described may be developed. Let us assume that a hypothetical institution has students enrolled in two majors — Letters and Applied Sciences — and in two academic levels — lower division and upper division. The institution is composed of two academic organizational units —

a Department of Humanities and a Department of Sciences — and that the courses offered by each are categorized into two levels — #1 and #2. From transcripts or other suitable records, it is possible to make a count of the enrollments in each major at each level, as shown in the left hand column of Table III-1. In addition, a determination is made of the total instructional activity consumed by the students in each category, as illustrated in the table by proceeding to the right. Lastly, the distribution of this activity among the producing departments at each course-level is tabulated in the last four columns.

TABLE III-1

ILLUSTRATIVE EXAMPLE OF

COMPILATION OF ENROLLMENT AND TRANSACTIONS OF INSTRUCTIONAL ACTIVITY CONSUMPTION AND PRODUCTION

Student Category		Student	Instr. Activity	Instructional Activity Production-SCH			
				Dept. of Humanities		Dept. of Sciences	
Level	Major	Enrollment	Consumption-SCH	Course-Level #1	Course-Level #2	Course-Level #1	Course-Level #2
Lower	Letters	100	2,900	1,200	900	800	
Upper	Letters	78	2,500	200	1,700	400	200
Lower	App. Science	50	1,500	500	100	800	100
Upper	App. Science	50	1,600		600	400	600
		278	8,500	1,900	3,300	2,400	900

An examination of the contents of this table will further the understanding of the relationship between student enrollment and instructional activity. Proceeding from left to right in the first row, it will be noted that there are 100 students enrolled at the lower division level in the Letters major and collectively these same students registered for a total of 2,900 SCH. In turn, this 2,900 SCH was provided by 1,200 SCH at Course-Level #1 and 900 at Course-Level #2 by the Department of Humanities and 800 SCH at Course-Level #1 by the Department of Sciences. For each category of student the consumption of instructional activity is equal to the production of instructional activity by the academic departments to meet the requirements of these students. The summation over all categories of students of the instructional activity at each course-level within each department represents the total production load imposed upon each organizational unit to meet the needs of all students. Note that, although instructional activity consumption can be categorized only in terms of student characteristics and production only in terms of organizational identities, the individual transactions of which both are composed can be identified in terms of both the consuming student and the producing department.

Data compiled on a total or even a sample basis from actual institutional records will serve as a satisfactory surrogate for delineating the combined effect of curricula requirements and student preferences upon the demand for instructional activity. Such a record, given a forecast of enrollment appropriately disaggregated, may be employed as a vehicle for projecting future instructional activity production by organizational unit. This is accomplished by constructing two matrices from data of the type described. The first is called the Average Course-Load Matrix and the second the Induced Course-Load Matrix.

Average Course-Load Matrix

For a single student, the course-load represents simply the summation of the instructional activity over all courses for which he is registered in the given interval of time, usually a term, semester, or year. When the course-loads for all students in an institution are grouped in accord with student categorization — academic level and major program of study — and the average computed for each group, the values for what is called the Average Course-Load Matrix are generated. Thus the matrix is composed of a series of values representing the average consumption of instructional activity per student in each category for the same periods of time for which the enrollment forecast is subdivided. Again, examining the hypothetical example, the Average Course-Load Matrix is computed by dividing the instructional activity consumption by the corresponding student enrollment for each category as shown in Table III-2.

TABLE III-2

ILLUSTRATIVE EXAMPLE OF

COMPUTATIONS FOR AVERAGE COURSE-LOAD MATRIX

Student Category		Student	Instr. Activity	Average Course-Load Matrix
Level	Major	Enrollment	Consumption-SCH	Average Course-Load Per Student
Lower	Letters	100	2,900	29
Upper	Letters	78	2,500	32
Lower	App. Science	50	1,500	30
Upper	App. Science	50	1,600	32

Induced Course-Load Matrix

The induced course-load for a single student simply represents the percentage distribution of his total course-load for a given period of time among the course-levels within the various departments providing instruction to him. When the induced course-loads for all students in an institution are grouped in accord with the various applicable categorization of students, the values comprising the Induced Course-Load Matrix are developed. Thus the Induced Course-Load Matrix is composed of the values representing the fractional distribution of the instructional activity consumption for each category of student among all of the course-levels and organizational units teaching the courses. For the hypothetical example, the Induced Course-Load Matrix is computed by expressing the instructional activity production by course-level within department as fractions of the instructional activity consumption for the same student category, as shown in Table III-3.

TABLE III-3

ILLUSTRATIVE EXAMPLE OF

COMPUTATIONS FOR INDUCED COURSE-LOAD MATRIX

Student Category			Instructional Act. Production SCH				Induced Course-Load Matrix			
			Dept. of Human.		Dept. of Sci.		Fractional Distribution			
							Dept. of Human.		Dept. of Sci.	
Level	Major	Instr. Activity Consumption-SCH	C-L #1	C-L #2	C-L #1	C-L #2	C-L #1	C-L #2	C-L #1	C-L #2
Lower	Letters	2,900	1,200	900	800		.414	.310	.276	
Upper	Letters	2,500	200	1,700	400	200	.080	.680	.160	.080
Lower	App. Science	1,500	500	100	800	100	.333	.067	.533	.067
Upper	App. Science	1,600		600	400	600		.375	.250	.575

Projection Model

Provided that the values comprising the Average Course-Load and Induced Course-Load Matrices, as computed from transactions of historical data, are representative of those applicable to the future, the two tables may be used together with a given forecast of enrollment to generate projections of instructional activity production. This is done by first multiplying the enrollment by the Average Course-Load Matrix to develop the consumption of instructional activity by student category, and then the latter by the Induced Course-Load Matrix to determine the instructional activity production by course-level for each academic organizational unit. Finally, the production activities are then aggregated across all student categories for each course-level within organizational unit to derive the total production activity by course-level for each unit.

To show in tabular form how this procedure works, assume a given forecast of enrollment for a single time frame and the applicability of the Average Course-Load and Induced Course-Load Matrices developed from the hypothetical example. The steps in the process are shown in Table III-4.

TABLE III-4

ILLUSTRATIVE EXAMPLE OF PROJECTION MODEL

Student Category		(ENROLLMENT INPUT)		(AVERAGE COURSE LOAD MATRIX)		Instr. Activity
Level	Major	Projected Student Enrollment		Ave. Course Load Per Student		Consumption SCH
Lower	Letters	120	x	29	=	3,480
Upper	Letters	60	x	32	=	1,920
Lower	App. Science	70	x	30	=	2,100
Upper	App. Science	60	x	32	=	1,920

(INDUCED COURSE-LOAD MATRIX)

	Fractional Distribution					Instr. Activity Production-SCH			
	Dept. of Human.		Dept. of Sci.			Dept. of Human.		Dept. of Sci.	
	C-L #1	C-L #2	C-L #1	C-L #2		C-L #1	C-L #2	C-L #1	C-L #2
x	.414	.310	.276		=	1,441	1,078	961	
x	.080	.680	.160	.080	=	154	1,305	307	154
x	.333	.067	.533	.067	=	699	141	1,119	141
x		.375	.250	.375	=		720	480	720
						2,294	3,244	2,867	1,015

(PRODUCTION OUTPUT)

MATHEMATICAL RELATIONSHIPS

The mathematical relationships involved in developing both the Average Course-Load and Induced Course-Load Matrices as well as their application for projection purposes are shown below.

Given:

$E_{clm,t}$ = student enrollment in year t at campus c at academic level l in major m

$S_{clm,t}$ = instructional activity consumption in year t by students enrolled at campus c at academic level l in major m

Therefore, the Average Course-Load is derived as follows:

$$C_{clm} = S_{clm,t} / E_{clm,t}$$

where: C_{clm} = average course-load of students enrolled at campus c at academic level l in major m

And additionally given:

$S_{clm/cfg,t}$ = instructional activity production in year t at campus c by department f at course-level g for consumption by students enrolled at campus c at academic level l in major m

Therefore, the Induced Course-Load is derived as follows:

$$X_{clm/cfg} = S_{clm/cfg,t} / S_{clm,t}$$

where: $X_{clm/cfg}$ = fraction of instructional activity consumption produced at campus c in department f at course-level g

For projecting instructional activity production for year t+1:

$$S_{cfg,t+1} = \sum_{\substack{l=1 \\ m=1}}^{\substack{l=n \\ m=n}} (E_{clm,t+1}) \quad (C_{clm}) \quad (X_{clm/cfg}) \quad \text{for c, f, and g} = 1, 2, 3, 4 \ldots n$$

where: $S_{cfg,t+1}$ = instructional activity production projected for year t+1 at campus c in department f at course-level g

$E_{clm,t+1}$ = given student enrollment projection for year t+1

IV: DEVELOPMENT OF HISTORICAL BASE

In the previous chapters, it was shown

1: *that interdependencies exist between the major-program composition of enrollment and the subject-matter composition of instructional activity, and*

2: *that, for some historical period of time, enrollment may be related to the consumption of instructional activity and the latter to the production of instructional activity by the Average and Induced Course-Load Matrices, which in turn may be employed in conjunction with a forecast of enrollment to project instructional activity.*

This chapter is concerned with establishing a suitable base of historical data for use in developing the Average and Induced Course-Load Matrices required for subsequent projection of instructional activities for a large multi-campus institution, namely The Pennsylvania State University.

CRITERIA FOR STRUCTURE

Inasmuch as the composition of the output from the projection model is dependent upon the structure of the historical base used to develop the Average and Induced Course-Load Matrices, the delineation of the required output constitutes the first step in establishing data specifications. This is necessary to assure the utility of the model as a vehicle for supplying both explicit and perceived informational requirements.

For an application of this type to a specific institution, the establishment of output specifications requires that consideration be given to characteristics unique to the institution and the environment in which its operations are conducted. In the case of The Pennsylvania State University, discussion may be categorized within one of the following general areas: first, the informational requirements for preparation of budgetary submissions in compliance with instructions issued by the Commonwealth of Pennsylvania's jurisdictional agencies, and secondly, the informational needs of the University itself for resource management.

As a public institution, Penn State is dependent for a major portion of its funding for instructional purposes upon appropriation by the House of Representatives and Senate of the Commonwealth. In support of same, two conceptually-different but data-consistent documents are currently required, both of which employ annualized instructional activity data on an actual as well as a projected basis. One is a formula budget and the other a PPBS submission. Although neither of these two systems have been in operation a sufficient length of time to assure their content will be fixed over time, the conceptual rationale for each does provide a basis for specifying likely data input needs. The formula submission, in its current form, is based upon the consumption of instructional activity by students at specified academic-levels; currently, the procedure is applied without regard to curriculum or subject-matter but there is no assurance that such distinctions will not be imposed in the future. The PPBS submission, on the other hand, requires instructional activity reported on a production basis subdivided by subject-matter in accord with a discipline taxonomy, based upon the discipline-division portion — or the initial two digits — of the Federally-adopted HEGIS taxonomy. Thus in order to meet mandated requirements for budget submission purposes, the instructional

activity model must have the capability to generate both historical and projected measures of instructional activity at various academic-levels in terms of consumption as well as production where the latter is subdivided in such a way to clearly identify various subject-matter fields on a basis permitting inter-institutional comparison.

Superimposed upon the specifications required to meet external demands for instructional activity data, are those related to use within the University. Internally, measures of instructional activity production are employed as an input to the internal budgetary system as a mechanism for resource allocation. However, because of the diversity of size with respect to the organizational components of the University, it is not possible to define a single set of budgeted resource-centers, which are universally applicable to all locations. In some cases, a center will be a department, in others a college, and in still others an entire campus. In order to provide sufficient flexibility for aggregating instructional activity measures to a level consistent with budgeted resource centers applicable to any given situation within the University arising through future organizational change, a set of budgeted resource-centers was defined, which was composed of the departmental units of each college at the one campus of the system where the particular college was organized at its greatest size. For the College of Medicine, this delineation obviously means that the organizational units were defined as they exist at the Hershey Medical Center; for the balance of the colleges, the structure of the University Park Campus was applicable. Employing these subdivisions as the smallest level of aggregation on which instructional activity will be measured will permit aggregations to higher levels when such are appropriate to budgeted resource-centers having a broader scope of subject-matter responsibility.

From an overall standpoint, the external criteria, imposed by means of the vehicles required in support of the appropriation submission, and the internal criteria, established through analysis of organizational constraints, define a single set of criteria which must be adopted in order to provide instructional activity measurements meeting both sets of perceived needs. These may be summarized as follows:

1: Instructional activity must be measured both from a consumption and a production standpoint at each location.

2: The smallest organizational unit over which activity will be measured is the budgeted departmental unit applicable to the college structure at the University Park Campus and the Hershey Medical Center.

3: Each of these organizational units must be appropriately coded for the applicable two-digit HEGIS discipline-division code.

SPECIFICATIONS

In accord with the broad criteria adopted for assessing the utility of instructional activity data in relation to both internal and external needs, each measurement of activity was structured as follows:

1: Consumption Activities

— by campus

— by division-level

— by college or category of enrollment for major program

2: Production Activities

— by campus

— by college and department providing instruction

— by course-level

Campuses

Twenty-five geographical identities are currently employed to classify the locations at which the resident instruction function is conducted by the University. These encompass the twenty-two campuses and centers of the University as well as three other geographical identities which are essentially extensions of programs administered by organizational units at the University Park Campus. For this reason the latter three — involving the nursing program conducted at selected hospitals, graduate students registered for off-campus research, and students enrolled in the study-abroad program — were included for purposes of developing historical transaction data as part of University Park Campus. Shown below are the twenty-two locational categories adopted for use in compiling instructional activity data on both a consumption and production basis.

TABLE IV-1

CAMPUSES

Allentown Center
Altoona Campus
Beaver Campus
Behrend Campus
Berks Campus
Capitol Campus
Delaware County Campus
DuBois Campus
Fayette Campus
Hazleton Campus
Hershey Medical Center
King of Prussia Graduate Center
McKeesport Campus
Mont Alto Campus
New Kensington Campus
Ogontz Campus
Schuylkill Campus
Shenango Valley Campus
University Park Campus
Wilkes Barre Campus
Worthington-Scranton Campus
York Campus

Division-Level

On the consumption side, instructional activity was categorized in accord with five so-called division-levels of enrolled students. Within the hierarchy conceived and used to describe the academic levels of students, categorization may be made from the standpoint of degree-level — associate, baccalaureate, etc. — and within certain of these by student achievement level — first year, second year, etc. Within each degree-level, aggregations over appropriate student-levels may be derived to develop what are called division-levels. The interrelationship among these levels is shown below.

TABLE IV-2
HIERARCHY OF ACADEMIC LEVELS

DEGREE-LEVEL	STUDENT-LEVEL	DIVISION-LEVEL
Associate	1	Associate
	2	
Baccalaureate	1	Lower Division Bacc.
	2	
	3	Upper Division Bacc.
	4 & 5	
Graduate	1	Graduate-1
	2 or more	Graduate-2
Adjunct	Not Applicable	Adjunct

For the application under review, the consumption of instructional activity was categorized in accord with division-levels, with one exception. The specific exception concerns the grouping of so-called Graduate-1 and

Graduate-2 into a common Graduate division-level, an imposition necessitated because of current institutional data limitations.

Colleges or Categories of Enrollment

Consumption activities were also assigned in accord with each student's college of enrollment for pursuit of his major program. In addition to the eleven colleges offering degree programs at one or more degree-levels, there are four other administrative categories in which a student may be classified for purposes of enrollment. For undergraduate study, a student's program is administered by the Division of Counseling if he has not selected a major for study. At the Capitol Campus, the responsibility for undergraduate majors rests with the faculty at that location and the same is true for the preponderance of graduate programs. Students in interdisciplinary programs are classified within the Inter-College category for purposes of enrollment. A student will be assigned non-degree status for purposes of enrollment categorization if he has been admitted to the Graduate School but has not selected a field of study or if he has simply adjunct status. Shown in the following table is a summary of the categories of enrollment adopted for use in classifying consumption activities.

TABLE IV-3

COLLEGES OR CATEGORIES OF ENROLLMENT

College of Agriculture
College of Arts and Architecture
College of Business Administration
College of Earth and Mineral Sciences
College of Education
College of Engineering
College of Health, Physical Education and Recreation
College of Human Development
College of Liberal Arts
College of Medicine
College of Science
Division of Counseling
Capitol Campus
Inter-College
Non-Degree

The adoption of colleges or categories of enrollment as a convention for classifying instructional activity consumption as contrasted to major fields of study deserves further explanation. Earlier it was stated that one of the major reasons for undertaking the development of this model was that its predecessor, IA-1, was viewed, in light of the then emerging need for output in a more disaggregated form, as potentially inefficient for routine application in an expanded mode. Thus an objective in the design of the IA-2 model was to expand the level of detail in the output and to do so at a lower cost of operation. Although it was viewed as mandatory to disaggregate production activity from fourteen colleges and administrative units providing instruction to one hundred and twenty departments, the same was not true in the case of consumption activities. Consequently, rather than provide in an appropriate way for over three hundred undergraduate and graduate fields of study, the fifteen colleges or categories of enrollment were employed for classification on the consumption side with an ensuing significant gain thereby provided in the operating efficiency of the model.

Colleges and Departments Providing Instruction

Production activities were classified in accordance with the college and department academically responsible for instruction in each subject-matter area. Most of the instruction in the University is provided within the structures of the eleven colleges. Exceptions to this rule are as follows: instruction at the Capitol Campus, inter-college study, and R.O.T.C. courses. Table IV-4 contains a list of the organizational units adopted for purposes of classifying production activities together with the appropriate five-digit budget code used internally by the University and the HEGIS discipline-division code.

TABLE IV-4

COLLEGES AND DEPARTMENTS PROVIDING INSTRUCTION*

College and Department	PSU Budget	HEGIS CODE Bacc. & Above	HEGIS CODE Assoc.
College of Agriculture			
Agricultural Economics	204-08	01	54
Agricultural Education	204-10	08	55
Agricultural Engineering	204-12	09	53
Entomology	204-13	04	54
Agronomy	204-15	01	54
Plant Pathology	204-16	04	54
Animal Science	204-17	01	54
Dairy Science	204-37	01	54
Forestry	204-53	01	54
Horticulture	204-66	01	54
Poultry Science	204-77	01	54
Veterinary Science	204-88	04	54
Inter-Department	204-00	01	54
College of Arts and Architecture			
General Education	205-07	10	50
Architecture	205-11	02	53
Art History	205-14	10	50
Landscape Architecture	205-33	02	53
Music	205-38	10	50
Art	205-44	10	50
Theatre	205-48	10	50
Inter-Department	205-00	10	50
College of Business Administration			
Accounting	206-11	05	50
Business Logistics	206-15	05	50
Finance	206-19	05	50
Insurance and Real Estate	206-24	05	50
Management Science	206-35	05	50
Marketing	206-36	05	50
Inter-Department	206-00	05	50
College of Earth and Mineral Sciences			
Geography	224-12	22	55
Meteorology	224-18	19	53
Geosciences	224-19	19	53
Mineral Economics	224-24	19	53
Mineral Engineering	224-25	09	53
Materials Science and Constitution	224-36&20	09	53
Inter-Department	224-00	19	53

*Status at end of 1971-72 academic year.

TABLE IV-4 (continued)

COLLEGES AND DEPARTMENTS PROVIDING INSTRUCTION

College and Department	PSU Budget	HEGIS Code Bacc. & Above	HEGIS Code Assoc.
College of Education			
Academic Curriculum and Field Experience	212-06&32	08	55
Art Education	212-08	08	55
Counselor Education	212-09	08	55
Educational Psychology	212-10	08	55
Educational Policy	212-12	08	55
Vocational Education	212-14	08	55
Home Economics Education	212-21	08	55
Music Education	212-24	08	55
Special Education	212-31	08	55
Inter-Department	212-00	08	55
College of Engineering			
Aerospace Engineering	205-14	09	53
Architectural Eng.	205-17	09	53
Chemical Engineering	215-19	09	53
Civil Engineering	215-21	09	53
Electrical Engineering	215-31	09	53
Acoustics	215-33	09	53
Engineering Mechanics	215-37	09	53
Engineering Science	215-38	09	53
Industrial Engineering	215-44	09	53
Mechanical Engineering	215-51	09	53
General Engineering	215-55	09	53
Nuclear Engineering	215-56	09	53
Inter-Department	215-00	09	53
College of Health, Physical Education and Recreation			
Instruction	227-11	08	55
College of Human Development			
Individual and Family Studies	218-11	13	50
Biological Health	218-12	12	52
Biological Health, Nursing	218-13	12	52
Community Development	218-14	21	55
Man-Environment Relations	218-15	13	50
Inter-Department	218-00	21	55

TABLE IV-4 (continued)

COLLEGES AND DEPARTMENTS PROVIDING INSTRUCTION

College and Department	PSU Budget	HEGIS Code Bacc. & Above	HEGIS Code Assoc.
College of Liberal Arts			
General Education	221-07	15	50
Anthropology	221-12	22	55
Classics	221-15	11	50
Economics	221-18	22	55
English	221-20	15	50
French	221-28	11	50
German	221-31	11	50
History	221-34	22	55
Journalism	221-41	06	50
Labor Studies	221-43	05	50
Linguistics	221-46	15	50
Philosophy	221-51	15	50
Political Science and Public Administration	221-54&37	22	55
Psychology	221-55	20	55
Religious Studies	221-56	15	50
Slavic	221-59	11	50
Sociology	221-64	22	55
Spanish, Italian, Portugese	221-65	11	50
Speech	221-67	15	50
Inter-Department	221-05	49	50

College and Department	PSU Budget	HEGIS Code Bacc. & Above	HEGIS Code Assoc.
College of Medicine			
Anatomy	217-12	04	54
Anesthesiology	217-14	12	52
Comprehensive Medicine	217-15	12	52
Behavorial Science	217-18	12	52
Biological Chemistry	217-22	12	52
Family Medicine	217-25	12	52
Medicine	217-41	12	52
Obstetrics	217-47	12	52
Pathology	217-49	04	54
Pediatrics	217-51	12	52
Pharmacology	217-52	12	52
Psychiatry	217-59	12	52
Radiology	217-62	12	52
Surgery	217-67	12	52
College of Science			
General Education	228-07	04	54
Astronomy	228-09	19	53
Biochemistry	228-12	04	54
Biology	228-15	04	54
Chemistry	228-21	19	53
Computer Science	228-28	07	51
Mathematics	228-44	07	51
Microbiology	228-46	04	54
Physics	228-54	19	53
Statistics	228-74	17	53

TABLE IV-4 (continued)

COLLEGES AND DEPARTMENTS PROVIDING INSTRUCTION

College and Department	PSU Budget	HEGIS Code Bacc. & Above	HEGIS Code Assoc.
Inter-College			
Environmental Pollution Control	231-20	49	50
Regional Planning and Admin.	231-22	49	50
Other Graduate Inter-College	232-01	49	50
Undergraduate Inter-College	231-09	49	50

College and Department	PSU Budget	HEGIS Code Bacc. & Above	HEGIS Code Assoc.
Capitol Campus			
Humanities, Social Sciences and Education	260-10	22	55
Engineering Technology	260-20	09	53
Business Administration	260-30	05	50
Mathematics	260-90	07	51
R.O.T.C.			
All Departments	287-	18	-

Course-Levels

Production activities were structured within the five different course-levels, as shown below.

TABLE IV-5

COURSE-LEVELS

0-399
400-499
500-599 & 700-799
600-611
800-899

Credit

Instructional activity was measured in terms of student credit hours. Inasmuch as three exceptions currently exist within the University to this convention, suitable transformations were necessary in these cases. The first exception concerns course credit award for undergraduate degree students at the Capitol Campus and for whom credit is awarded in terms of units where one unit is equivalent to four student credit hours. The second and third exceptions involve courses designated as 601 and 611, which are recorded only in terms of registrations; in accord with a basis for conversion provided by the Graduate School, each 601 and 611 registration was transformed into eight and three student credit hours respectively.

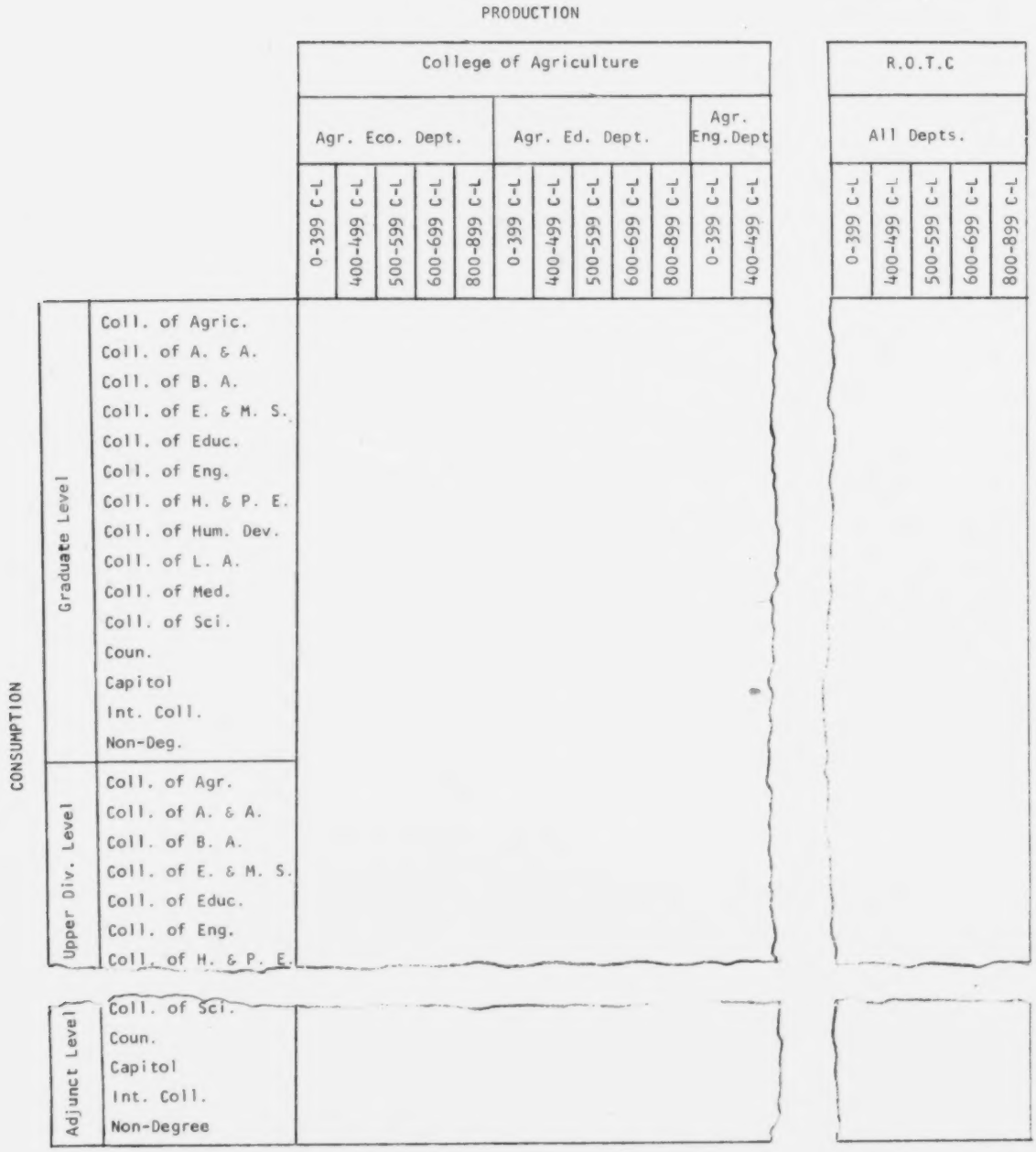
HISTORICAL TRANSACTION BASE

Common for use in developing both the Average Course-Load and Induced Course-Load Matrices, both of which are needed for the projection application, is a compilation of instructional activity transaction data, measured in terms of student credit hours, for the recent academic year. By this is meant a tabulation which equates demand, as measured by the consumption by students in each division-level within each college or category of enrollment, to supply, as measured by production at each course-level by each department with-

in each college at each campus. Currently, such a matrix applicable to each campus contains seventy-five rows and six-hundred columns. Shown in Figure IV-1 is a schematic diagram of such a matrix.

FIGURE IV-1

SCHEMATIC DIAGRAM OF TRANSACTION BASE FOR ONE CAMPUS



Source of Data

For The Pennsylvania State University, the most suitable and accurate source of data currently available for construction of the historical transaction base of instructional activity is what is referred to internally as the grade-tape. This is a machine addressable file of each course registration and contains data appropriate for identifying the characteristics of both the course and the student enrolled in same. In addition to encompassing what may be characterized as classroom activity, it also includes records of dissertation, credit-by-exam, advanced placement examination, and audits. The grade-tape is compiled at the end of every term and used by the Records Office as the medium for updating student transcripts and is, therefore, regarded as possessing a relatively high degree of integrity.

Compilation

Only selected fields within each course-registration record on the grade-tapes are used to develop the historical transaction base of instructional activity. These are as follows: student type, term-standing, major code and abbreviation; course subject-matter code and abbreviation, number, and credit award; and campus. With the exception of the major and course subject-matter abbreviations, all of these are employed in classifying the course credit in each course-registration record in accord with the specifications delineated for identifying the consumption and production characteristics. The two abbreviations are employed for identification purposes only in those cases where a so-called "illegal" entry appears in the corresponding code fields. Although the categorization systems used with each of these fields are not identical to those needed for classifying an instructional activity measure in accord with the specifications delineated for the model, suitable transformations are possible and are incorporated within the program logic.

Shown in Table IV-6 are the appropriate fields used within each record on the grade-tape to provide transformations into the categorization of instructional activity in accord with the model specifications set forth earlier in this chapter.

TABLE IV-6

FIELDS IN COURSE-REGISTRATION RECORD

USED TO CLASSIFY INSTRUCTIONAL ACTIVITY

Specification	Fields in Course-Registration Record
Campus	2 character Campus Code
Division-Level	1 character Student-Type Code 2 character Term-Standing
College or Category of Enrollment	3 character Major Code 5 character Major Abbreviation
College and Department of Instruction	3 character Course Subject-Matter Code 5 character Course Subject-Matter Abbreviation
Course-Level	3 character Course-Number
Credit	Credit award as specified except multiply by 8 and 3 for Course-Numbers 601 and 611 respectively and by 4 for Capitol upper-division baccalaureate students

AVERAGE COURSE-LOAD MATRIX

Within the context of the application under review, the Average Course-Load Matrix is composed of values representing the average annual consumption of instructional activity, as measured in student credit hours, per student at each division-level in each college or category of enrollment at each campus. For example, one element in the matrix would represent the average consumption per year at the Altoona Campus for a lower-division baccalaureate student enrolled for a major within the College of Engineering.

In the sense employed in developing the Average Course-Load Matrix, the term "average" does not connote a strict mathematical mean. Each value is actually calculated by first computing the sum over all four terms in the academic year of the instructional activity consumption by all students categorized within each division level of each college of enrollment at a campus and then dividing by the Fall Term head-count enrollment of students in the same level and college. The anomaly between annual instructional activity consumption and Fall Term enrollment, however, does not precipitate a significant problem, inasmuch as forecasts of enrollments are provided as input on a like basis.

The values, of which the Average Course-Load Matrix is composed, are computed from two types of data. The first is the instructional activity consumption by division-level within each college or category of enrollment at each campus for the most recently completed academic year, as described in the previous section of this chapter. The second is the head-count enrollment by division-level in each college or category of enrollment by campus for the Fall Term within the same academic year; enumerations of student enrollment are compiled and available from the Records Office of the Division of Admissions, Records, and Scheduling.

INDUCED COURSE-LOAD MATRIX

The Induced Course-Load Matrix is composed of vectors, each of which represents the fractional distribution of instructional activity consumption for each division-level in each college or category of enrollment at each campus among the producing departments at each course-level. For example, one vector would represent the fractional distribution among all course-levels of producing departments at the Berks Campus of the instructional activity consumed by all lower-division students enrolled in the College of Liberal Arts.

The values comprising the vectors in the Induced Course-Load Matrix are computed from the historical compilation of instructional activity, described previously in this chapter, for the most recent historical year. Each vector is calculated by dividing the total activity at each campus consumed by students at each division-level in each college or category of enrollment into activity produced at each course level by each department to meet the needs of these same students. Since consumption of activity by a particular group of students must equal the production of activity for these same students, the summation of the values, of which each vector is composed, must equal 1.0.

V: PROJECTION MODEL

In the previous chapters, it was shown

1: *that interdependencies exist between the major-program composition of enrollment and the subject-matter composition of instructional activity,*

2: *that, for some historical period of time, enrollment may be related to the consumption of instructional activity and the latter to the production of instructional activity by the Average and Induced Course-Load Matrices, which in turn may be employed in conjunction with a forecast of enrollment to project instructional activity, and*

3: *how a suitable base of historical data may be compiled and used for development of these two matrices.*

This chapter is concerned with employment of the Average and Induced Course-Load Matrices as a projection model which, given a forecast of enrollment, may be used to generate projections of instructional activity.

OPERATION OF MODEL

The projection model consists of two major components: the Average Course-Load and Induced Course-Load Matrices. The procedures for development of both of these were outlined in the previous chapter. The input to the model consists of a projection for as many years into the future as desired

of the Fall Term headcount enrollment by campus, division-level, and college or category of enrollment. This enrollment projection is developed from aggregation of selective data elements from the output of the Student Flow Model.

Procedurally, the following steps, as schematically shown in Figure V-1, are involved in the projection process:

1: The projected number of students enrolled in the Fall Term of each year at each division-level in each college or category of enrollment at each campus is multiplied by the corresponding average course-load from the Average Course-Load Matrix to derive the instructional activity consumption for the particular group of students.

2: Each of these instructional activity consumption values is then multiplied by the series of fractions, representing its distribution among producing departments from the Induced Course-Load Matrix, to derive the production of instructional activity at each course-level by each department for students enrolled at each division-level in each college or category of enrollment at each campus.

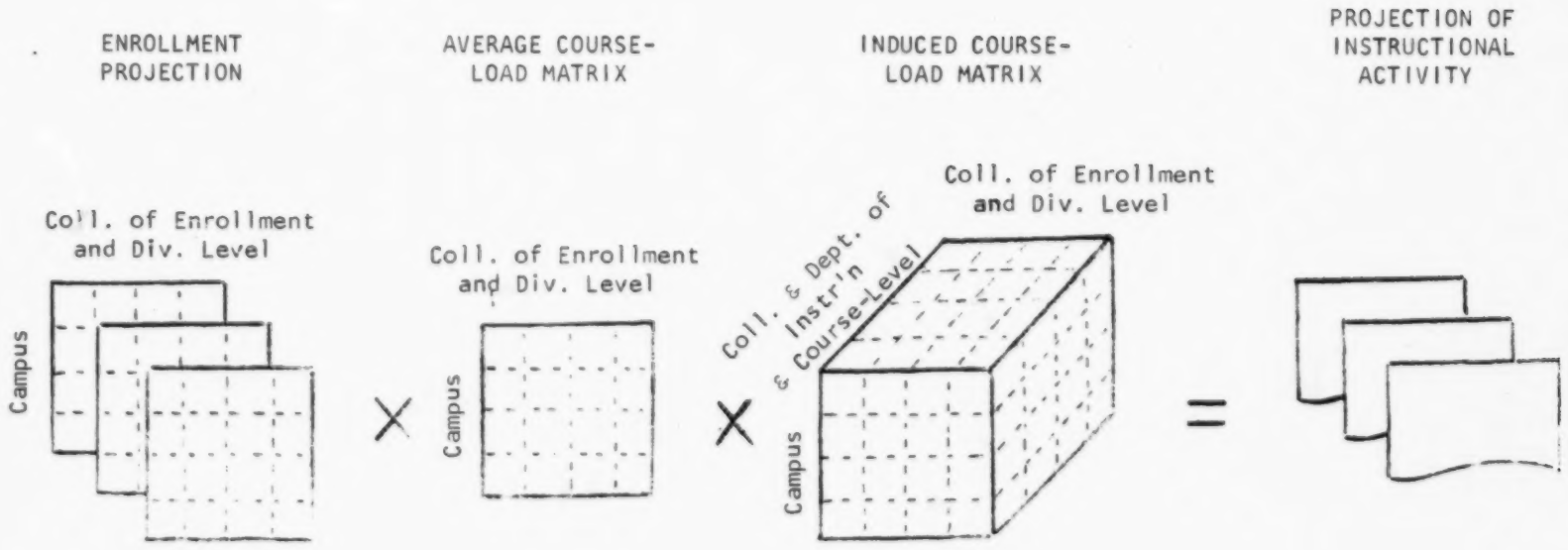
3: The resulting values of instructional activity are then aggregated to generate output over any desired combination relating to the identifiable characteristics associated with the consumption or production functions giving rise to these activities.

OUTPUT

At the outset, it should be noted that the emphasis placed in this report on the projection objective should not be inadvertently misconstrued

FIGURE V-1

SCHEMATIC DIAGRAM OF PROJECTION MODEL



as implying that output is projected solely for future time frames. In reality, output for an historical term or academic year can be produced within a few days after completion of the appropriate time period in the identical context as that applicable to the projection model on an annual basis. Thus the system provides an integrated vehicle, on a consistent basis, for routine historical reporting as well as for projection application.

Currently output from the projection model as well as the historical compilation process is of two different types. The first, characterized as general purpose output, provides a high level of detail concerning the interrelations between production and consumption of instructional activity; it is intended for use as a source document, primarily at the campus, college, or departmental levels, for making a wide variety of assessments. The second type is of a special purpose nature and is designed to meet the requirements of specific applications; currently these are limited to those concerning the budgetary process.

General Purpose

Currently the general purpose output is composed of two types of tables. The first shows the annual instructional activity production by each college at each course-level for consumption by students at one division level enrolled in one college of enrollment at one campus. Inasmuch as there may be as many as 1,650 of these tables in a single run, only one set of these tables, itemizing the production in all colleges for consumption by students at each division level in the College of Earth and Mineral Sciences at the University Park Campus, will be presented for illustrative purposes. This particular set is shown in Tables V-1A through D. Each table displays the relationship between consumption by students enrolled in one college and production provided by each of the colleges to meet the curriculum needs of these students. By supressing the distribution by course-level, as shown in Tables V-1A through

D, the production by each college of instruction for consumption by students at each of the division-levels within a single college may be developed as shown in Table V-2.

TABLES V-1A THROUGH D

PRODUCTION BY EACH COLLEGE OF INSTRUCTION AND COURSE-LEVEL FOR CONSUMPTION BY STUDENTS ENROLLED IN THE COLLEGE OF EARTH AND MINERAL SCIENCES AT UNIVERSITY PARK

STUDENT CREDIT HOURS PER YEAR

Table V-1A: Graduate Division-Level

	By Course-Level					
	0-399	400-499	500-599	600-611	800-899	Total
Agriculture	6	52	28			86
Arts & Arch.	8	4				12
Business Admin.	16	28	72			116
Education	15	32	51			98
Engineering	12	150	163			325
Health and Phy. Ed.	4					4
Human Development		6	8			14
Liberal Arts	175	73	53			301
Earth & Min. Sci.	75	1,552	2,694	4,956		9,277
Science	84	612	102	6		804
Inter College			3			3
R.O.T.C.	16	4				20
Total	411	2,513	3,174	4,962		11,060

Table V-1B: Upper-Division Baccalaureate Level

	By Course-Level					
	0-399	400-499	500-599	600-611	800-899	Total
Agriculture	21	30				51
Arts and Arch.	247	6				253
Business Admin.	565	9				574
Education	41	2				43
Engineering	682	221	3			906
Health & Phy. Ed.	169					169
Human Development	52	3				55
Liberal Arts	1,574	42				1,616
Earth & Min. Sci.	1,980	4,937	78			6,995
Science	1,282	816				2,098
Inter College		3				3
R.O.T.C.	71	6				77
Total	6,684	6,075	81			12,840

Table V-1C: Lower-Division Baccalaureate Level

	By Course-Level					
	0-399	400-499	500-599	600-611	800-899	Total
Agriculture	8					8
Arts & Arch.	162					162
Business Admin.	80					80
Education	12					12
Engineering	302					302
Health & Phy. Ed.	375	4				379
Human Development	6					6
Liberal Arts	1,774	4				1,778
Earth & Min. Sci.	1,442	162				1,604
Science	4,236	73				4,309
Inter College		3				3
R.O.T.C.	40					40
Total	8,437	246				8,683

Table V-1D: All Division-Levels Combined

	By Course-Level					
	0-399	400-499	500-599	600-611	800-899	Total
Agriculture	35	82	28			145
Arts & Arch.	417	10				427
Business Admin.	661	37	72			770
Education	68	34	51			153
Engineering	996	371	166			1,533
Health & Phy. Ed.	548	4				552
Human Development	58	9	8			75
Liberal Arts	3,523	119	53			3,695
Earth & Min. Sci.	3,497	6,651	2,772	4,956		17,876
Science	5,602	1,501	102	6		7,211
Inter College		3	3			6
R.O.T.C.	127	10				137
Total	15,532	8,831	3,255	4,962		32,580

TABLE V-2

PRODUCTION BY EACH COLLEGE OF INSTRUCTION FOR CONSUMPTION BY STUDENTS ENROLLED AT EACH DIVISION-LEVEL IN THE COLLEGE OF EARTH AND MINERAL SCIENCES AT UNIVERSITY PARK

STUDENT CREDIT HOURS PER YEAR

	For Division Level					
	Grad.	U-D Bacc.	L-D Bacc.	Assoc.	Adj.	Total
Earth & Min. Sci.	9,277	6,995	1,604			17,876
Agriculture	86	51	8			145
Arts & Arch.	12	253	162			427
Business Admin.	116	574	80			770
Education	98	43	12			153
Engineering	325	906	302			1,533
Health & Phy. Ed.	4	169	379			552
Human Development	14	55	6			75
Liberal Arts	301	1,616	1,778			3,695
Science	804	2,098	4,309			7,211
Inter College	3	3				6
R.O.T.C.	20	77	40			137
Sub-Total Other Coll.	1,783	5,845	7,076			14,704
Total All Colleges	11,060	12,840	8,680			32,580

From a series of tables for each of the colleges of enrollment at a single campus, comparable to those depicted in Tables V-1A through D, for a single college of enrollment it is possible to construct a set of tables which show the consumption by students at one division-level of each college or category of enrollment which is met by production of a single college of instruction. For illustrative purposes a set of these tables are shown in Tables V-3A through F for production by the College of Earth and Mineral Sciences at the University Park Campus. These tables display the relationship between consumption by students enrolled in each of the colleges and production provided by one college to meet the curricular needs of these students. By suppressing the distribution by course-level, as shown in Tables V-3A through F, the consumption by students at the various division-levels enrolled in each college or category of enrollment and met by production of a single college may be developed, as shown in Table V-4.

TABLES V-3A THROUGH F

PRODUCTION BY COLLEGE OF EARTH AND MINERAL SCIENCES AND EACH COURSE-LEVEL FOR CONSUMPTION BY STUDENTS ENROLLED IN EACH COLLEGE AT UNIVERSITY PARK

STUDENT CREDIT HOURS PER YEAR

Table V-3A: Graduate Division-Level

	By Course-Level					
	0-399	400-499	500-599	600-611	800-899	Total
Agriculture	3	60	23			86
Arts & Arch.		15	9			24
Business Admin.	1	6	3			10
Education	3	151	10			164
Engineering	2	100	53	9		164
Health & Phy. Ed.		20				20
Human Development		13	10			23
Liberal Arts	5	78	34	3		120
Earth & Min. Sci.	75	1,552	2,694	4,956		9,277
Science	9	71	26	16		122
Div. of Coun. Inter College			8			8
Non Degree	73	132	10			215
Total	171	2,198	2,880	4,984		10,233

Table V-3B: Upper-Division Baccalaureate Level

	By Course-Level					
	0-399	400-499	500-599	600-611	800-899	Total
Agriculture	638	24				662
Arts & Arch	848	49	9			906
Business Admin.	1,925	75				2,000
Education	3,901	754				4,655
Engineering	1,229	151	1			1,381
Health & Phy. Ed.	161					161
Human Development	761	34				795
Liberal Arts	3,851	402	3			4,256
Earth & Min. Sci.	1,980	4,937	78			6,995
Science	1,586	257	3			1,846
Div. of Counseling	180	17				197
Inter College						
Non-Degree						
Total	17,060	6,700	94			23,854

Table V-3C: Lower-Division Baccalaureate Level

	By Course Level					
	0-399	400-499	500-599	600-611	800-899	Total
Agriculture	267					267
Arts & Arch.	619					619
Business Admin.	1,563	3				1,566
Education	1,518	8				1,526
Engineering	279	3				282
Health & Phy. Ed.	289	4				293
Human Development	1,230	4				1,234
Liberal Arts	2,747	21				2,768
Earth & Min. Sci.	1,442	162				1,604
Science	485	6				491
Div. of Counseling	564					564
Inter College						
Non-Degree						
Total	11,003	211				11,214

Table V-3D: Associate Division-Level

	By Course-Level					
	0-399	400-499	500-599	600-611	800-899	Total
Agriculture						
Arts & Arch.						
Business Admin.						
Education						
Engineering	16					16
Health & Phy. Ed.						
Human Development	1					1
Liberal Arts						
Earth & Min. Sci.						
Science						
Div. of Counseling						
Inter College						
Non-Degree						
Total	17					17

Table V-3E: Adjunct Division-Level

	By Course-Level					
	0-399	400-499	500-599	600-611	800-899	Total
Agriculture						
Arts & Arch.						
Business Admin.						
Education						
Engineering						
Health & Phy. Ed.						
Human Development						
Liberal Arts						
Earth & Min. Sci.						
Science						
Div. of Counseling						
Inter College						
Non-Degree	114					136
Total	114					136

Table V-3F: All Division-Levels Combined

	By Course-Level					
	0-399	400-499	500-599	600-611	800-899	Total
Agriculture	908	84	23			1,015
Arts & Arch.	1,467	64	18			1,549
Business Admin.	3,489	84	3			3,576
Education	5,422	913	10			6,345
Engineering	1,526	254	54	9		1,843
Health & Phy. Ed.	450	24				474
Human Development	1,992	51	10			2,053
Liberal Arts	6,603	501	37	3		7,144
Earth & Min. Sci.	3,497	6,651	2,772	4,956		17,876
Science	2,080	334	29	16		2,459
Div. of Coun.	744	17				761
Inter College			8			8
Non Degree	187	154	10			351
Total	28,365	9,131	2,974	4,984		45,454

TABLE V-4

PRODUCTION BY COLLEGE OF EARTH AND MINERAL SCIENCES FOR CONSUMPTION BY STUDENTS ENROLLED AT EACH DIVISION-LEVEL IN EACH COLLEGE AT UNIVERSITY PARK

STUDENT CREDIT HOURS PER YEAR

	For Division-Level					
	Grad.	U-D Bacc.	L-D Bacc.	Assoc.	Adj.	Total
Earth & Min. Sci.	9,277	6,995	1,604			17,876
Agriculture	86	662	267			1,015
Arts & Arch.	24	906	619			1,549
Business Admin.	10	2,000	1,566			3,576
Education	164	4,655	1,526			6,345
Engineering	164	1,381	282	16		1,843
Health & Phy. Ed.	20	161	293			474
Human Development	23	795	1,234	1		2,053
Liberal Arts	120	4,256	2,768			7,144
Science	122	1,846	491			2,459
Div. of Coun.		197	564			761
Inter College	8					8
Non-Degree	215				136	351
Sub-Total Other Coll.	956	16,859	9,610	17	136	27,578
Total All Colleges	10,233	23,854	11,214	17	136	45,454

The second of the two types of tables for general purpose application show the instructional activity production by course-level of each department of one college for consumption by students at each division-level of all colleges or categories of enrollment at each campus. Since there may be as many as 1,270 of these tables for a single run, only one set will be presented for illustrative purposes. Again the set, shown in Tables V-5A through F, represents production by the departments in the College of Earth and Mineral Sciences at the University Park Campus. By suppressing the course-level, the production by department for consumption by students at various division-levels may be developed as shown in Table V-6.

TABLES V-5A THROUGH F

PRODUCTION BY EACH DEPARTMENT OF THE COLLEGE OF EARTH AND MINERAL SCIENCES

BY EACH COURSE-LEVEL FOR CONSUMPTION BY STUDENTS ENROLLED

IN ALL COLLEGES AT UNIVERSITY PARK

STUDENT CREDIT HOURS PER YEAR

Table V-5A: Graduate Division-Level

	By Course-Level					
	0-399	400-499	500-599	600-611	800-899	Total
Geography	54	552	338	420		1,364
Meteorology	21	306	320	668		1,315
Geosciences	60	648	911	1,431		3,050
Mineral Economics		139	179	301		619
Mineral Engineering	11	139	477	357		984
Mat'l. Sci. & Min. Const'n.	25	410	651	1,807		2,893
Inter Department		4	4			8
Total	171	2,198	2,880	4,984		10,233

Table V-5 B: Upper-Division Baccalaureate Level

	By Course-Level					
	0-399	400-499	500-599	600-611	800-899	Total
Geography	4,903	1,501	18			6,422
Meteorology	4,147	1,219	14			5,380
Geosciences	5,125	1,159	37			6,321
Mineral Economics	62	489				551
Mineral Engineering	135	708	25			868
Mat'l.Sci. & Min.Const'n.	2,688	1,614				4,302
Inter Dept.		10				10
Total	17,060	6,700	94			23,854

Table V-5C: Lower-Division Baccalaureate Level

	By Course-Level					
	0-399	400-499	500-599	600-611	800-899	Total
Geography	1,764	58				1,822
Meteorology	3,067	58				3,125
Geosciences	4,937	28				4,965
Mineral Economics	36	22				58
Mineral Engineering	117	24				141
Mat'l.Sci. & Min. Const'n.	1,082	21				1,103
Inter Dept.						
Total	11,003	211				11,214

Table V-5D: Associate Division-Level

	By Course-Level					
	0-399	400-499	500-599	600-611	800-899	Total
Geography						
Meteorology	16					16
Geosciences	1					1
Mineral Economics						
Mineral Engineering						
Mat'l.Sci. & Min.Const'n.						
Inter Dept.						
Total	17					17

Table V-5E: Adjunct Division-Level

	By Course-Level					
	0-399	400-499	500-599	600-611	800-899	Total
Geography	34	7				41
Meteorology	19	2				21
Geosciences	44	11				55
Mineral Economics	2	2				4
Mineral Engineering	5					5
Mat'l.Sci. & Min. Const'n.	10					10
Inter Dept.						
Total	114	22				136

Table V-5F: All Division-Levels Combined

	By Course-Level					
	0-399	400-499	500-599	600-611	800-899	Total
Geography	6,755	2,118	356	420		9,649
Meteorology	7,270	1,585	334	668		9,857
Geosciences	10,167	1,846	948	1,431		14,392
Mineral Economics	100	652	179	301		1,232
Mineral Engineering	268	871	502	357		1,998
Mat'l.Sci. & Min.Const'n.	3,805	2,045	651	1,807		8,308
Inter Dept.		14	4			18
Total	28,365	9,131	2,974	4,984		45,454

TABLE V-6

PRODUCTION BY DEPARTMENT OF THE COLLEGE OF EARTH AND MINERAL SCIENCES FOR CONSUMPTION BY STUDENTS ENROLLED AT EACH DIVISION-LEVEL IN ALL COLLEGES AT UNIVERSITY PARK

STUDENT CREDIT HOURS PER YEAR

	For Division-Level					
	Grad.	UD	LD	Assoc.	Adj.	Total
Geography	1,364	6,422	1,822		41	9,649
Meteorology	1,315	5,380	3,125	16	21	9,857
Geosciences	3,050	6,321	4,965	1	55	14,392
Mineral Economics	619	551	58		4	1,232
Mineral Engineering	984	868	141		5	1,998
Mat'l.Sci. & Min.Const'n.	2,893	4,302	1,103		10	8,308
Inter Dept.	8	10				18
Total	10,233	23,854	11,214	17	136	45,454

Special Purpose

Of the three types of specialized output currently generated, one is used as an input to the University's internal budgeting system and the other two in connection with the preparation of appropriation requests.

As an input to the internal budget system, tables are generated for the production of instructional activity by each department of each college by campus categorized both by course-level and by consuming division-level. An illustration of this type of output is shown in Table V-7 for the College of Earth and Mineral Sciences at the University Park Campus. It should be noted that in this particular application, the division-levels are not categorized in strict accord with the hiearchy defined in Chapter IV, inasmuch as lower-division baccalaureate, associate, and adjunct division-levels, are combined into a single so-called lower-division-level.

TABLE V-7

PRODUCTION BY EACH DEPARTMENT OF THE COLLEGE OF EARTH AND MINERAL SCIENCES

BY COURSE-LEVEL FOR CONSUMPTION BY STUDENTS

ENROLLED AT EACH DIVISION-LEVEL

STUDENT CREDIT HOURS PER YEAR

		By Course-Level					For Division-Level		
	Budget	0-399	400-499	500-599	600-611	800-899	Lower Div.	Upper Div.	Grad.
Geography	224-12	6,755	2,118	356	420		1,863	6,422	1,364
Meteorology	224-18	7,270	1,585	334	668		3,162	5,380	1,315
Geosciences	224-19	10,167	1,846	948	1,431		5,021	6,321	3,050
Mineral Economics	224-24	100	652	179	301		62	551	619
Mineral Engineering	224-25	268	871	502	357		146	868	984
Mat'l. Sci. & Min. Const'n.	224-36&20	3,805	2,045	651	1,807		1,113	4,302	2,893
Inter Department	224-00		14	4				10	8
Total		28,365	9,131	2,974	4,984		11,367	23,854	10,233

For use in preparing the University's appropriation request, two types of specialized summary output are currently generated. The first is an analysis by campus of the annual instructional activity production for consumption by students enrolled at each division-level. An extract from this listing for one year is shown in Table V-8. The second, an extraction from which is depicted in Table V-9, is an analysis by HEGIS discipline-division subject-matter of the annual production for consumption at the graduate division-level and at an aggregation of the upper-division baccalaureate, lower-division bacculaureate, associate, and adjunct division-levels, which collectively is categorized for this purpose as undergraduate; in addition are shown the conversions of the instructional activity at these two specified levels for each HEGIS discipline-division into so-called FTE students for purposes of resource determination.

TABLE V-8

PRODUCTION BY CAMPUS FOR CONSUMPTION BY DIVISION-LEVEL

STUDENT CREDIT HOURS PER YEAR

	For Division-Level					
Campus	Graduate	Upper-Div. Bacc.	Lower-Div. Bacc.	Assoc.	Adjunct	Total
Altoona		492	31,856	13,792	4,234	50,374
Allentown		108	2,493	1,682	643	4,926
Behrend	577	3,602	33,569	5,223	3,265	46,236
Berks		71	10,945	8,725	827	20,568
Beaver		464	21,390	5,103	1,468	28,425
Capitol	6,416	61,247			498	68,161

TABLE V-9

PRODUCTION BY HEGIS DISCIPLINE-DIVISION FOR CONSUMPTION BY DIVISION-LEVEL

STUDENT CREDIT HOURS PER YEAR

HEGIS	Instr. Activity For Div.-Level			FTE Students		
Discipline-Div.	Graduate	Undergraduate	Total	Graduate	Undergraduate	Total
01	6,310	16,782	23,092	262.9	559.4	822.3
02	348	11,397	11,745	14.5	379.9	394.4
03						
04	13,830	104,494	118,324	576.3	3,483.1	4,059.4
05	7,855	65,982	73,837	327.3	2,199.4	2,526.7

EVALUATION

Although the conceptual basis for models of the type described in this report have received relatively widespread acceptance, information concerning their predictive performance is limited. (5). Jewett et al. (7) and Breneman (3) have conducted analyses on the stability over time of the historically observed coefficients comprising the Induced Course-Load Matrices and Newton and Enscore (13) and Enscore (14) have evaluated the effect of both linear and non-linear forecasting methods upon projected coefficients. Because of the relative paucity of such endeavors, no standardized methodological concept exists for evaluation although a review of existing reports does reveal a certain commonality of approach.

Because of seemingly contradictory circumstances of conceptual acceptance but of evaluative scarcity, it is of interest to speculate upon the causes giving rise to the limited availability of evaluation studies. First, causes for predictive deficiencies of coefficients are generally institutionally-specific and thus appropriate remedies may not have widespread application or even interest within the academic community; all of the investigators cited above plus Weathersby (19) have noted that curricular, organizational, and calendar changes are traceable causes of variations to which Hussain (6) has added the aspect of poor historical data integrity. Secondly, in the preponderance of cases in which such a model is implemented, improvement in predictability was an implicit assumption since the model replaced subjective or iniative procedures, which according to Armstrong and Grohman (1) exhibit a propensity to generate forecasts of poor accuracy.

In order to provide a basis for evaluation of the accuracy of the model described in this report, a run was made utilizing as input the Fall Term 1972 enrollment of the University to project the 1972-73 instructional activity,

which in turn was then compared with the actual results for the same fiscal year. From a system-wide standpoint, the total projection differed by only 0.7% from the actual measurement.

However, this value is of limited significance for internal management application, since it is achieved in part as a result of compensating errors in over- and under-projecting the instructional activity production of the organizational entities of which the University is composed. Furthermore, it is frequently infeasible from an operational standpoint to consider the interchange of resources for the instructional function particularly among campuses and, in the case of the University's largest campus at University Park, among colleges. For this purpose, the forecast errors of these organizational units are of interest. Collectively these organizational units are categorized internally as administrative divisions and it is at this level that budgetary responsibility rests. The differences between the projected and actual instructional activity production values for each administrative division are shown in Table V-10. The summation of these differences, without regard for sign, expressed as a percentage of the actual value for the total system amounts to 2.5%. This means that 2.5% of the projection of instructional activity was distributed among the administrative divisions in a manner differing from that which actually occurred.

In order to provide some further insight on the variation by administrative division, both the percent and absolute differences between the projected and actual instructional activity production values for each administrative division were plotted as shown in Figure V-2. From a practical standpoint, situations involving both a relatively high percentage error and a high absolute error are ones which might present difficulties in resolving operationally; on the other hand those which exhibit small differences on both or either of the two measures can usually be surrmounted without major dislocation of

resource assignments. Examination of Figure V-2 reveals that there is a tendency for most of the points to be concentrated in the lower left-hand corner, signifying low percentage as well as low absolute errors. The two points at the extreme right, showing relatively low percent but high absolute errors, represent two of the University's largest administrative divisions, in which even a very small percentage error would generate a sizeable absolute difference between actual and projected values. For two of the three points above 10%, the cause of the errors may be traced to problems of informational integrity which is interesting in view of the previously mentioned observation on this aspect by Hussain (6).

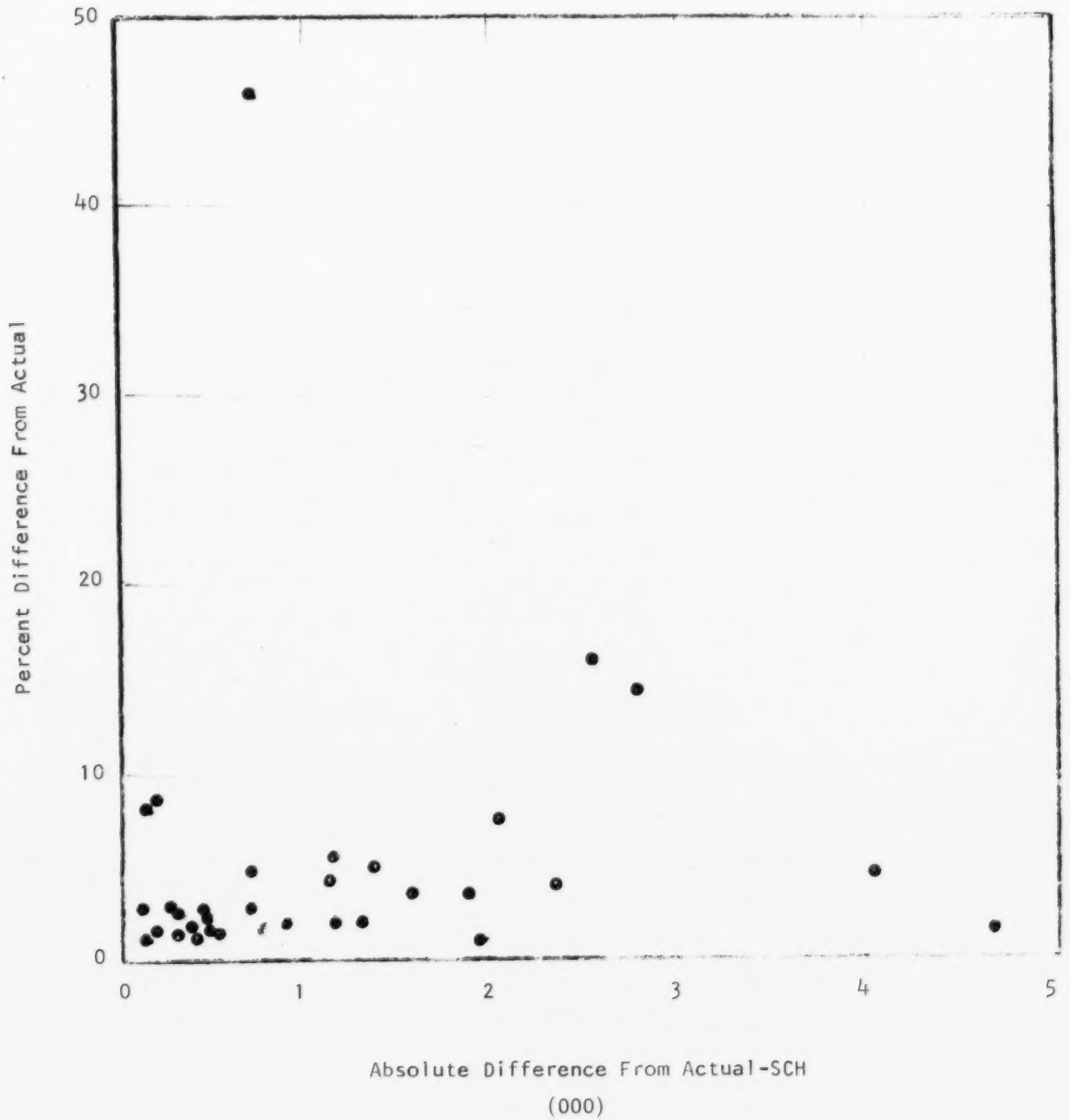
TABLE V-10

COMPARISON OF ACTUAL AND PROJECTED 1972-73 PRODUCTION OF INSTRUCTIONAL ACTIVITY BY ADMINISTRATIVE DIVISION

	Production-SCH		Difference	
	Actual	Projected	SCH	%
	51,272	50,374	- 898	- 1.8
	4,803	4,926	+ 123	+ 2.6
	45,883	46,236	+ 353	+ .8
	20,710	20,568	- 142	- .7
	28,826	28,425	- 401	- 1.4
	69,437	68,161	- 1,276	- 1.8
	30,638	31,308	+ 670	+ 2.2
	14,736	14,427	- 309	- 2.1
	28,860	29,962	+ 1,102	+ 3.8
	21,981	22,451	+ 470	+ 2.1
	2,485	2,302	- 183	- 7.4
	22,310	21,142	- 1,168	- 5.2
	30,418	31,806	+ 1,388	+ 4.6
	28,306	26,301	- 2,005	- 7.1
	54,716	55,163	+ 447	+ .8
	19,456	16,710	- 2,746	-14.0
	18,885	19,246	+ 421	+ 2.2
	15,825	15,119	- 706	- 4.5
	11,833	12,114	+ 281	+ 2.4
	16,184	16,047	- 137	- .8
	15,749	13,272	- 2,477	-15.7
	28,612	28,139	- 473	- 1.6
	64,159	61,864	- 2,295	- 3.6
	62,899	61,068	- 1,831	- 2.9
	97,646	93,644	- 4,002	- 4.1
	54,536	53,773	- 763	- 1.4
	40,630	41,059	+ 429	+ 1.0
	72,235	71,093	- 1,142	- 1.6
	293,225	297,877	+ 4,652	+ 1.6
	47,125	45,454	- 1,671	- 3.5
	189,229	191,118	+ 1,889	+ 1.0
	1,565	2,296	+ 731	+46.7
	2,304	2,512	+ 208	+ 9.0
Total	1,507,479	1,495,957	11,522	- 0.7
Absolute Sum	1,507,479		37,789	2.5

FIGURE V-2

PERCENT AND ABSOLUTE DIFFERENCES BETWEEN PROJECTED AND ACTUAL INSTRUCTIONAL ACTIVITY PRODUCTION VALUES FOR 1972-73 BY ADMINISTRATIVE DIVISION



VI: SYSTEM APPLICATION

In the previous chapters, it was shown

1: *that interdependencies exist between the major-program composition of enrollment and the subject-matter composition of instructional activity,*

2: *that, for some historical period of time, enrollment may be related to the consumption of instructional activity and the latter to the production of instructional activity by the Average Course-Load and Induced Course-Load Matrices, which in turn may be employed in conjunction with a forecast of enrollment to project instructional activity,*

3: *how a suitable base of historical data may be compiled and used for development of these two matrices, and*

4: *how these two matrices may be used as a projection model which, given a forecast of enrollment, may be employed to generate projections of instructional activity.*

This chapter is concerned with a description of the system developed to carry out the steps outlined in Chapters IV and V for routine application within The Pennsylvania State University for generation of both historical

transactions and projections of instructional activity. The interrelationships among the components are delineated and the function, procedural steps, and operational cost of each programmed module are outlined in brief. Details concerning the program logic and application are shown in the Appendices.

COMPONENTS OF SYSTEM

The system comprising the Instructional Activity Model consists of five modules. These are programmed in FORTRAN IV for operation on the IBM system 370/165 in the Computation Center. Two of these modules, INDEX-1 and SORT-1, are concerned with transforming the records maintained on the student grade-tapes into a form suitable for the application. The third, HIST-1, produces the historical tabulation of instructional activity and computes the fractions comprising the Induced Course-Load Matrix. CONSUM-1, the fourth program, transforms a projection of enrollment from the Student Flow Model into a projection of instructional activity consumption for input to the last module, ITER-1, which generates, by means of the Induced Course-Load Matrix, projections of instructional activity production.

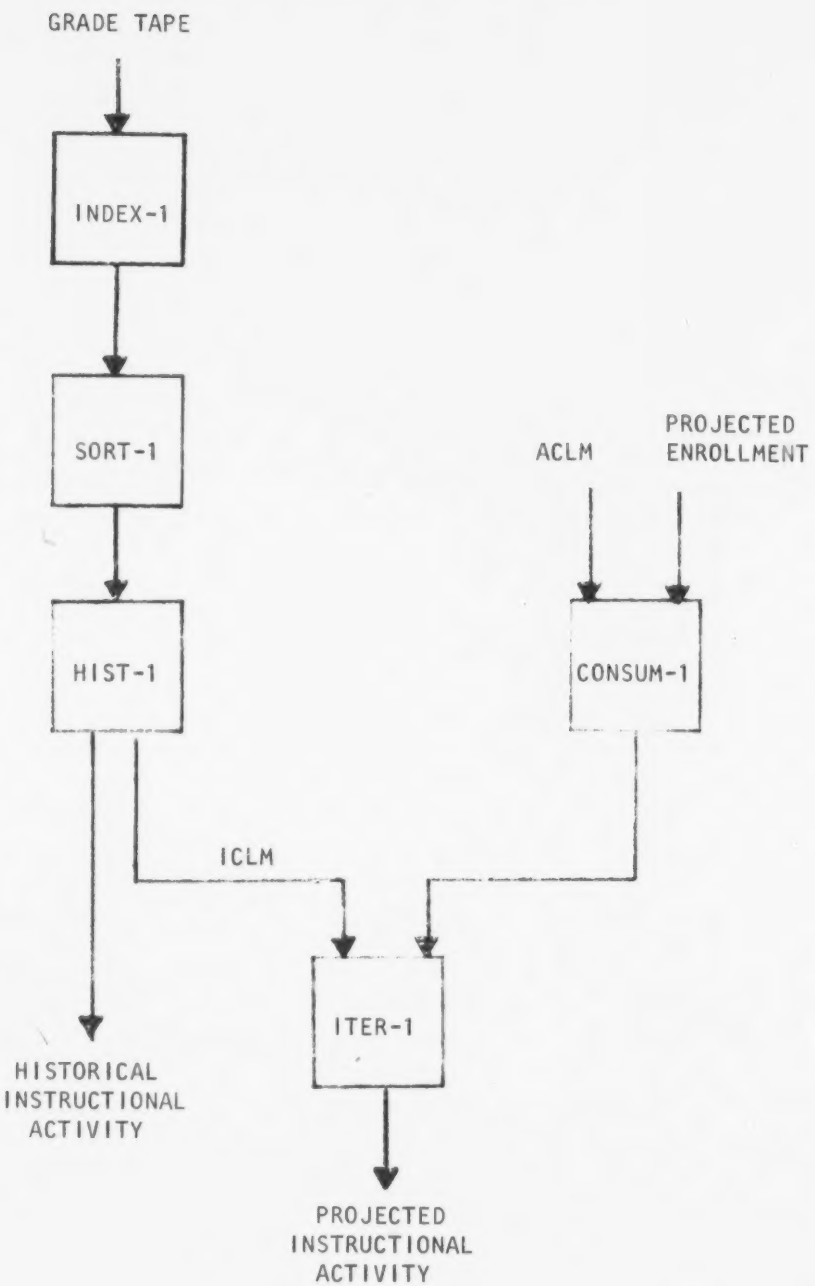
The relationship of these modules to one another is shown in Figure VI-1 and a brief description of each is provided below.

INDEX-1 Module

The INDEX-1 program reads each course-registration record on the grade-tape and constructs for each a set of seven numeric indices, which describes the content of the record in accord with the specifications outlined in Chapter IV. The course-registration records, each of which is 458 bytes in length, are read from the grade-tapes for the most recent academic year. From nine of the fields in each record — student type, term-standing, and major code and abbreviation; course code and abbreviation, number, and credits;

FIGURE VI-1

FLOW DIAGRAM OF INSTRUCTIONAL ACTIVITY MODEL



and campus — appropriate transformations are made by means of internal logic into numeric indices which delineate the characteristics of the consuming student and the producing organization for the student credit hours associated with the course.

In addition, by means of a subroutine the module attempts to generate indices for so-called "illegal" fields — i. e. ones not properly denoted within the categorization system applicable to the field — by means of a set of ancilliary rules.

SORT-1 Module

The SORT-1 program retrieves the indexed records generated by INDEX-1 and sorts them in ascending order by campus, division-level, and college or category of enrollment.

HIST-1 Module

The HIST-1 program prepares the historical output from the sorted records produced by SORT-1 and computes the fractions comprising each vector in the Induced Course-Load Matrix. The records are retrieved from the SORT-1 output in the order specified and the student credit hours are added incrementally to both the matrix of college of instruction by course-level for a division-level in each college of enrollment and to the matrix of department of instruction by course level for each division-level applicable to each campus until all of the records pertaining to the college of enrollment have been read. At this point, a vector of fractions for the Induced Course-Load are computed and put onto tape.

The procedure is then repeated for each of the remaining colleges of enrollment until all records pertaining to the particular division-level have been processed. The entire cycle is then conducted for each of the remaining division-levels.

After all records for the initial campus have been read, the process is initiated for the next campus and proceeds by campus, division-level, and college of enrollment until all records have been read.

CONSUM-1 Module

The CONSUM-1 program reads the enrollment projections from the output from the DISAG-1 module of the Student Flow Model and transforms these values into instructional activity consumption for input to the ITER-1 module. The enrollment projections for each year are aggregated over appropriate student-levels within degree-levels to derive enrollments by year, campus, division-level, and college or category of enrollment. These values are then multiplied by the Average Course-Load Matrix, provided as input to this step, to generate instructional activity consumption by year, campus, division-level, and college or category of enrollment.

ITER-1 Module

The ITER-1 program generates projections of instructional activity production from the output from the CONSUM-1 step and the Induced Course-Load Matrix generated from the HIST-1 module. In order of year, campus, division-level, and college or category of enrollment, each vector of fractions comprising the Induced Course-Load Matrix is read and multiplied by the appropriate instructional activity consumption values. The resulting products are then aggregated over appropriate college, departments, and course-levels and added incrementally to the totals until all of the input has been read. The resulting projection output is prepared in a form identical to that from the HIST-1 program.

COST OF OPERATION

The system as described serves two major purposes. The first is concerned with generation of historical tabulations of instructional activity and prepara-

tion of the Induced Course-Load Matrix, and the second with development of projections of instructional activity.

Generation of the historical tabulations and the Induced Course-Load Matrix involves the use of the INDEX-1, SORT-1, and HIST-1 programs. This procedure must be carried out only once a year and thus may be characterized as part of the updating process. The overall cost of operation involves an expenditure of $280 per year.

The projection process involves input of the Induced Course-Load Matrix from the HIST-1 program and a forecast of enrollment for as many years into the future as desired from the DISAG-1 module of the Student Flow Model, and application of the CONSUM-1 and ITER-1 modules. Once the Matrix has been updated for the most recent historical year, the projection procedure may be conducted any number of times without the necessity of repeating the steps involved in updating. The operating cost of each projection run is approximately $25 for each year in the time frame.

Shown in Table VI-1 are the operating characteristics involved in application of each of the five modules as described. It is of note that the data in this table were compiled on the basis of operation on an IBM System 360/67. With the installation of a 370/165, CPU time and cost for each module are expected to be lower.

TABLE VI-1

OPERATING CHARACTERISTICS

Module	CPU Time-Seconds	Records	Cost
INDEX-1*	1,800	6,000	$165
SORT-1	700	-	65
HIST-1	500	21,000	50
CONS-1	20	-	5
INDEX-1**	50	21,000	20

*four-terms of data

**projection period of one year

VII: FUTURE IMPROVEMENTS

An appraisal of the results of this project and the perceived use of the instructional activity model have made it desirable that certain innovations be incorporated within the model. Each of these is discussed briefly below.

CURRICULA CHANGES

Currently the projection phase of the model can reflect only curricular compositions generated from historical records. In those cases, however, where a curriculum change is perceived or where simply a "what if" question is posed, it would be advantageous to be able to take the change into account. In order to accomplish this objective, a provision will be made within the model to override appropriate sets of coefficients — i.e. the fractions comprising the distribution of a selected group of students' course work among the instructional departments — comprising the Induced Course-Load Matrix and to substitute where desirable values based upon appraisal of the projected situation.

PROJECTION ACCURACY

An explicit assumption in the use of the projection model is the future applicability of the coefficients comprising the most recent year's Induced Course-Load Matrix. Although evaluation of the accuracy results indicates the adequacy of this assumption, an innovation used in the prior IA-1 version of the model (4,14), involved the projection of coefficients from an historical time series of values by a methodology which has been improved during the elapsed interval of time (5). As an entirely separate project, this methodology

is being developed as a general-purpose projection technique for application to a variety of forecasting problems. This procedure will be evaluated for application to the instructional activity model after a sufficient historical base has been developed to assess the behavioral characteristics of the coefficients over time and to isolate and categorize those not amenable to the assumption of stability.

ORGANIZATIONAL CHANGE

Within any viable organization, internal dynamics are continuously causing changes in the structure and responsibilities of the entities of which it is composed and educational institutions are no exception to this phenomenum. With the present model it is difficult to impose for projection purposes an organizational structure and responsibility for subject matter areas and major fields of study which differ from those applicable in the most recent past. Consequently, efforts will be made to permit modification of historical records in such a way to permit changes in structure to be reflected in projections.

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A: INDEX-1 MODULE

The user must supply the following card input for use of the INDEX-1 module:

1: Department/College Matrix: The matrix consists of 99 rows — one for each possible number derived from the second and third positions of the course code — and 13 columns — one for each of the colleges of instruction — as derived from the alphabetic order of the first position in the course code. The numbers within the matrix represent the departmental assignment of responsibility for the subject matter as listed for each college in columns 1-2 of the Department and College Name Cards. Each card in the matrix is arranged as follows: columns 1-2, second and third digits in course code; columns 6-10, departmental number for first college; columns 11-15, departmental number for second college; 16-20 departmental number for third college; etc.

2: Campus Name Cards: Name of each campus, starting in column 1 with one campus per card and not exceeding 16 characters.

3: Division-Level Cards: Name of each division-level, starting in column 1 with one level per card.

4: Department and College Name Cards: These cards identify the number assigned to each department within a college, the departmental name, budget code, and HEGIS discipline division code, with one department per card. A college card follows the last

departmental card and contains the same identity number as the last departmental card. The identity numbers are assigned sequentially. Each card is arranged as follows: columns 1-2, departmental identity number; columns 3-18, department or college name; columns 19-26, budget code; and columns 28-29, HEGIS discipline division code.

5: Course Title Cards: These cards list the course code and subject matter abbreviation, with one course code per card. Each card is arranged as follows: columns 1-3, course code; columns 5-9, subject matter abbreviation. The cards must be numbered in accord with the alphabetical order of the abbreviation.

The INDEX-1 program produces as output on tape a record of seven numeric indices describing the content of each course-registration.

(1)

```
//DATA.INPUT DD *                                                    UT3H-4K
01                  1   2       1   1   4       6   2       1
02                                  2  20
03                                  1  21
04   1                  5                   2       3
05                          1           5           1       7   2
06   1                                      20       7
07                                      4       2       1
08                  8                                   6
09                                                     20
10               2  7       3   1   5   3   4       3   3   1
11                                                      3
12   2              2   4                          20       3   3   3
13                      1                          20       1
14   3                  4                                   4
15               6  2   5   2           5           5       4   3
16                      9                          4       1   2
17                          4                                           3
18   1                  8               5           5                   3   1
19                                                                      1
20                  5   4   5           1  13   7   3   5   4   1
21
22                      3   5                      6   3                   3
23                                                 21                      3
24   5                                             20                      3
25               3              6                  21               6
26                                                 20                      3
27                          6                                           3
28   7                  1                          7       3
29                                                                  10      3
30   7                  7                   1   2   3   6           7       1
31
32                      1                          3       3   7
33                                                                  6
34                                                 8       6
35  13   8   7              14                  5
36                      4                          1       6
37                          7
38                      6                                               1
39                                                                      2
40               1  3   1   12              1   1   3   2   8
41
42                                                                      2
43                  4                                                   2
44                      1                          18       4           2
45                  4               8                       5           2
46                                                 9       5           2
47               6  2                                                   2
48   8                  5                                               2
49                      5                                               2
50  13   4   5   1   4
51   4                  1   4                      10                  2
52  13                  7   12                     3       6
53                      1                                               1                   A-3
54   4                                             20
55   4                  6       10                 21               8
56                      4       10                 20       5
57   4                                             16
58   2                  5                          20
59                                                 11
```

60		5			11		2	12	7	3	1		1			
61								20							UT3H-4K	
62					11			16	7							
63	10							21					1			
64				4				13		3			1			
65					13				8		4					
66								18								
67																
68			7	5				13								
69	6			1												
70	13	7	7	1	5			14	9		1					
71					12			21					1			
72	11							13	10	5			1			
73					12											
74				5				13								
75					12		5		11							
76				1				15		5						
77							5									
78	1							16		5						
79													1			
80				8	12		6	16	12	5			1			
81	12				12		1									
82				8			1	16	13							
83					12											
84	9							16		5						
85	9				12		4									
86	9			5				1		6						
87							5	9								
88					12		3	20		6						
89							2	19								
90					12	1	2	17	14	6	1	4				
91								9								
92								17		5	10					
93																
94								18								
95	1						5									
96								19			4					
97							5				5					
98	9							16								
99	9															

(2)

ALTOONA
ALLENTOWN
BEHREND
BERKS
BEAVER
CAPITOL
DELAWARE
DUBOIS
FAYETTE
HAZLETON
KING OF PRUSSIA
MONT ALTO
MCKEESPORT
NEW KENSINGTON
OGANTZ
SCHUYLKILL
SCRANTON
SHENANGO
UNIVERSITY PARK
WILKES BARRE

GRADUATE
(3) ASSOCIATE DEGREE
LOWER DIVISION
UPPER DIVISION
ADJUNCT
(4)
1AGRIC ECO	204-08	01*	04,06,18,78,95
2AGRIC EDUC	204-10	08	12,58
3AGRIC ENG	204-12	09	14
4ENTOMOLOGY	204-13	04	51,
5AGRONOMY	204-15	01	24,
6PLANT PATH	204-16	04	69,
7ANIMAL SCI	204-17	01	28,30
8DAIRY SCI	204-37	01	48
9FORESTRY	204-53	01*	54,55,57,84,85,85,98,99
10HORTIC	204-66	01	63
11POLTRY SCI	204-77	01	72
12VET SCI	204-88	04	81
13INTER DEPT	204-00	01*	35,50,52,70
13AGRICULTURE			
1GEN EDUC	205-07	10	40
2ARCH	205-11	02	10
3ART HIST	205-14	10	25
4LAND ARCH	205-33	02	50
5MUSIC	205-38	10	60
6ART	205-44	10	15,47
7THEATRE	205-48	10	70
8INTER DEPT	205-00	10	35
8ARTS & ARCH			
1ACCOUNTING	206-11	05	01
2BUS LOG	206-15	05	12,15,47
3FINANCE	206-19	05	40
4INS & R E	206-24	05	43,45,56
5MGT SCI	206-35	05	20,50,58
6MARKETING	206-36	05	55
7INTER-DEPT	206-00	05	10,30,35,68,70
8BUS		05	08
8BUSINESS ADM			
1AC CURR & F EXP	212-063208		13,28,32,40,44,50,51,53,69,70,76
2ART ED	212-08	08	01
3ED PSYC	212-10	08	22
4ED POLICY	212-12	08	12,14,20,36,64
5VOC ED	212-14	08	04,48,49,68,74,86
6HOME ECO ED	212-21	08	38
7MUSIC ED	212-24	08	52
8SPEC ED	212-36	08	15,18,80,82
9INTER-DEPT	212-00	08	16
9EDUCATION			
1AERO ENG	215-14	09	05
2ARCH ENG	215-17	09	15
3AGRIC ENG		09	10
4CHEM ENG	215-19	09	17
5CIVIL ENG	215-21	09	20,22,70
6ELECT ENG	215-31	09	2527
7ACOUSTICS	215-33	09	37
8ENG MECH	215-37	09	45
9ENG SCI	215-38	09	50,51
10IND ENG	215-44	09	55,56
11MECH ENG	215-51	09	60,62

12GEN ENG	215-55	09	40,52,71,73,75,80,81,83,85,88,90
13NUCL ENG	215-56	09	65
14INTER-DEPT	215-00	09	35
14ENGINEERING			
1HPE INSTRN	227-11	08*	01,03,10,30,10
1HEALTH & PE			
1IND & FAM STUD	218-11	13	01,20,40,81,82
2BIOL HLTH	218-12	12*	02,30,60,89,90
3BIOL NURS	218-13	12	88
4COMM DEV	218-14	21	07,85
5MAN-ENVIR	218-15	13*	05,10,15,18,35,75,77,87,95,97
6INTER-DEPT	218-00	21	80
6HUMAN DEV			
1GEN EDUC	221-07	15*	36,40,86
2ANTHRO	221-12	22	04
3CLASSICS	221-15	11	10,11,30,32,52
4ECONOMICS	221-18	22	16
5ENGLISH	221-24	15	18
6FRENCH	221-28	11	22
7GERMAN	221-31	11	28
8HISTORY	221-34	22	34
9JOURNALISM	221-41	06	01,46,87,91
10LABOR STUD	221-43	05	51
11LINGUISTICS	221-46	15	59
12PHILOSOPHY	221-51	15	60
13POL SC & PUB AD	221-543/22		20,64,68,72,74
14PSYCHOLOGY	221-55	20	70
15RELIG STUD	221-56	15	76
16SLAVIC	221-59	11	57,62,78,80,82,84,98
17SOCIOLOGY	221-64	22	90,92
18SP IT & POR	221-66	11	44,66,94
19SPEECH	221-67	15	89,96
20INTER-DEPT	221-05	49	02,06,09,12,13,24,26,54,56,58,61,88
21INTERDIS LA		49	03,23,25,63,71,55
21LIBERAL ARTS			
1ANATOMY	217-12	04	05
2ANESH	217-14	12	07
3COMP MED	217-15	12	22,40
4BEHAV SCI	217-18	12	10
5BIOL CHEM	217-22	12	15
6FAM MED	217-25	12	30
7MEDICINE	217-41	12*	20,60,62
8OBSTETRICS	217-47	12	65
9PATHOLOGY	217-49	04	70
10PEDIATRICS	217-51	12	72
11PHARMA	217-52	04	75
12PSYCH	217-59	12	80
13RADIOL	217-62	12	82
14SURGERY	217-67	12	90
14MEDICINE			
1GEOGRAPHY	224-12	22	16
2METEOROLOGY	224-18	19	40
3GEOSCIENCES	224-19	19	04,12,20,28,32,60,64
4MIN ECO	224-24	19	44
5 MIN ENG	224-25	09	45,46,56,72,76,78,80,84,92
6MAT SCI & CONST	224-362009*		01,08,33,34,36,52,86,88,90
7INTER-DEPT	224-00	19	06
7EARTH & M S			
1GEN EDUC	228-07	04*	13,60,70,90
2ASTRONOMY	228-09	19	01

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3BIOCHEM          228-12  04      10,12
4BIOLOGY          228-15  04      14,15,96
5CHEMISTRY        228-21  19      20
6COMP SCI         228-28  07      25,97
7MATH             228-44  07      05,30,32
8MICRO            228-46  04*     40,55
9PHYSICS          228-54  19      65
10STATISTICS      228-74  17      29,92
10SCIENCE
 1 ENV POL CONT   231-20  49      07
 2REG PL & ADM    231-22  49*     05,16
 3PHY GEN SP EE   232-01  04*     10,12,15,18
 4STS,LAS         231-09  49      20,90
 4INTER-COLLEGE
 1ROTC            287-XX  18      01,10,20
 1ROTC
 1DOC
 1DOC
 1HUM SO SC & ED
 2ENG & TECH
 3 BUS & ADM
 4MATH
 4CAPITOL
 1ADJUNCT
 2NON-DEGREE GRAD
 3CONTINUING EDUC
 3NONDEGREE
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A28 A I           AGRI      SEPTEMBER 1972
S05 A M           SCI       SEPTEMBER 1972
A30 A NTR         AGRI      SEPTEMBER 1972
E01 ACCTG         BA        SEPTEMBER 1972
Y05 ADJ           NOND      SEPTEMBER 1972
V05 ADMIN         CAPC      SEPTEMBER 1972
L01 ADVT          LA        SEPTEMBER 1972
A07 AE RS         AGRI      SEPTEMBER 1972
G05 AERSP         ENGR      SEPTEMBER 1972
L03 AFRAS         CAPC      SEPTEMBER 1972
A18 AG            AGRI      SEPTEMBER 1972
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G10 AG E          ENGR      SEPTEMBER 1972
A06 AG EC         AGRI      SEPTEMBER 1972
A12 AG ED         AGRI      SEPTEMBER 1972
A14 AG M          AGRI      SEPTEMBER 1972
A24 AGRO          AGRI      SEPTEMBER 1972
W01 AIR           ROTC      SEPTEMBER 1972
L02 AM ST         CAPC      SEPTEMBER 1972
L02 AM ST         LA        SEPTEMBER 1972
A35 AN SC         AGRI      SEPTEMBER 1972
M05 ANAT          MED       SEPTEMBER 1972
M07 ANSTH         MED       SEPTEMBER 1972
L04 ANTHY         LA        SEPTEMBER 1972
B10 ARCH          A&A       SEPTEMBER 1972
W10 ARMY          ROTC      SEPTEMBER 1972
B15 ART           A&A       SEPTEMBER 1972
B25 ART H         A&A       SEPTEMBER 1972
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(5)

B40	ARTS	A&A	SEPTEMBER 1972
S01	ASTRO	SCI	SEPTEMBER 1972
E10	B A	BA	SEPTEMBER 1972
	B C T	CAPC	SEPTEMBER 1972
J02	B H	HUMN	SEPTEMBER 1972
E12	B LAW	BA	SEPTEMBER 1972
E15	B LOG	BA	SEPTEMBER 1972
V50	B PH	IDP	SEPTEMBER 1972
E20	B S	BA	SEPTEMBER 1972
E35	BA EC	BA	SEPTEMBER 1972
M15	BCHEM	MED	SEPTEMBER 1972
M10	BEMSC	MED	SEPTEMBER 1972
S13	BI SC	SCI	SEPTEMBER 1972
S10	BIOCH	SCI	SEPTEMBER 1972
S14	BIOL	SCI	SEPTEMBER 1972
L07	BLANG	CAPC	SEPTEMBER 1972
S15	BOT	SCI	SEPTEMBER 1972
S12	BPHYS	SCI	SEPTEMBER 1972
E08	BUS	CAPC	SEPTEMBER 1972
F04	BUSED	ED	SEPTEMBER 1972
F13	C & S	ED	SEPTEMBER 1972
M20	C C	MED	SEPTEMBER 1972
G20	C E	ENGR	SEPTEMBER 1972
G22	C E T	CAPC	SEPTEMBER 1972
L13	C L P	LA	SEPTEMBER 1972
L12	C LIT	LA	SEPTEMBER 1972
M22	C MED	MED	SEPTEMBER 1972
J10	C R S	HUMN	SEPTEMBER 1972
J18	C S	HUMN	SEPTEMBER 1972
L10	C STD	LA	SEPTEMBER 1972
J01	CD FR	HUMN	SEPTEMBER 1972
N01	CERSC	EMS	SEPTEMBER 1972
F14	CF ED	ED	SEPTEMBER 1972
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S20	CHEM	SCI	SEPTEMBER 1972
L09	CHNS	LA	SEPTEMBER 1972
J05	CL TX	HUMN	SEPTEMBER 1972
L11	CLASS	LA	SEPTEMBER 1972
S25	CMPSC	SCI	SEPTEMBER 1972
F12	CN ED	ED	SEPTEMBER 1972
F30	COM	BA	SEPTEMBER 1972
J07	COM D	HUMN	SEPTEMBER 1972
L14	COMST	LA	SEPTEMBER 1972
Y91	CONTE	NOND	SEPTEMBER 1972
I01	COUN	COUN	SEPTEMBER 1972
J15	CS EQ	HUMN	SEPTEMBER 1972
F15	D R R	ED	SEPTEMBER 1972
A4R	D SC	AGRI	SEPTEMBER 1972
V08	E ACS	IDP	SEPTEMBER 1972
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F18	E E C	ED	SEPTEMBER 1972
G27	E E T	CAPC	SEPTEMBER 1972
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A50	E R M	AGRI	SEPTEMBER 1972
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G51	E T	CAPC	SEPTEMBER 1972
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V06	ECLGY	IDP	SEPTEMBER 1972
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F16 ED	CAPC	SEPTEMBER 1972
F16 ED	ED	SEPTEMBER 1972
ED ET	CAPC	SEPTEMBER 1972
F20 EDAUM	ED	SEPTEMBER 1972
F22 EDPSY	ED	SEPTEMBER 1972
F32 EK ED	ED	SEPTEMBER 1972
F28 EL ED	CAPC	SEPTEMBER 1972
F28 EL ED	ED	SEPTEMBER 1972
N06 EM SC	EMS	SEPTEMBER 1972
L18 ENGL	LA	SEPTEMBER 1972
G35 ENGR	ENGR	SEPTEMBER 1972
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V10 EXTED	IDF	SEPTEMBER 1972
J30 F N	HUMN	SEPTEMBER 1972
N08 F SC	EMS	SEPTEMBER 1972
L20 F SER	LA	SEPTEMBER 1972
M30 FCMED	MED	SEPTEMBER 1972
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J20 FE HM	HUMN	SEPTEMBER 1972
E40 FIN	BA	SEPTEMBER 1972
B47 FIN A	A&A	SEPTEMBER 1972
A54 FOR	AGRI	SEPTEMBER 1972
A57 FOR R	AGRI	SEPTEMBER 1972
A55 FORSC	AGRI	SEPTEMBER 1972
L22 FR	LA	SEPTEMBER 1972
L23 FR ST	CAPC	SEPTEMBER 1972
J35 FS HA	HUMN	SEPTEMBER 1972
B48 G ART	A&A	SEPTEMBER 1972
J40 G F S	HUMN	SEPTEMBER 1972
N32 G SC	EMS	SEPTEMBER 1972
N12 GCHEM	EMS	SEPTEMBER 1972
L25 GCORE	CAPC	SEPTEMBER 1972
G52 GEN E	ENGR	SEPTEMBER 1972
V12 GENET	IDF	SEPTEMBER 1972
N16 GEOG	EMS	SEPTEMBER 1972
N20 GEOL	EMS	SEPTEMBER 1972
L28 GER	LA	SEPTEMBER 1972
A58 GN AG	AGRI	SEPTEMBER 1972
L24 GN AS	LA	SEPTEMBER 1972
N28 GPHYS	EMS	SEPTEMBER 1972
L30 GREEK	LA	SEPTEMBER 1972
J80 H DEV	HUMN	SEPTEMBER 1972
J75 H F S	HUMN	SEPTEMBER 1972
J77 H I	HUMN	SEPTEMBER 1972
J60 H P A	HUMN	SEPTEMBER 1972
H03 H P E	CAPC	SEPTEMBER 1972
H03 H P E	HPER	SEPTEMBER 1972
J81 HD FS	HUMN	SEPTEMBER 1972
F38 HE ED	ED	SEPTEMBER 1972
L32 HEBR	LA	SEPTEMBER 1972
F36 HI ED	ED	SEPTEMBER 1972
L34 HIST	LA	SEPTEMBER 1972
H01 HL ED	HPER	SEPTEMBER 1972
A63 HORT	AGRI	SEPTEMBER 1972
L36 HUMAN	CAPC	SEPTEMBER 1972
L36 HUMAN	LA	SEPTEMBER 1972
F40 I ART	ED	SEPTEMBER 1972
E47 I B	BA	SEPTEMBER 1972

G55	I F	ENGR	SEPTEMBER 1972
G56	I E T	CAPC	SEPTEMBER 1972
F48	I ED	ED	SEPTEMBER 1972
J82	I F S	HUMN	SEPTEMBER 1972
E45	I R E	BA	SEPTEMBER 1972
F49	I S	ED	SEPTEMBER 1972
F44	IA ED	ED	SEPTEMBER 1972
E43	INS	BA	SEPTEMBER 1972
F50	INSTM	ED	SEPTEMBER 1972
L40	INT U	LA	SEPTEMBER 1972
A64	INTAG	AGRI	SEPTEMBER 1972
L44	IT	LA	SEPTEMBER 1972
L46	JOURN	LA	SEPTEMBER 1972
L56	L A	LA	SEPTEMBER 1972
M40	L A M	MED	SEPTEMBER 1972
A67	L A T	AGRI	SEPTEMBER 1972
J85	L E C	HUMN	SEPTEMBER 1972
F51	L ED	ED	SEPTEMBER 1972
L51	L S	LA	SEPTEMBER 1972
L58	L SC	LA	SEPTEMBER 1972
L26	LAGEO	LA	SEPTEMBER 1972
B50	LARCH	A&A	SEPTEMBER 1972
L54	LATAM	LA	SEPTEMBER 1972
L52	LATIN	LA	SEPTEMBER 1972
L59	LING	LA	SEPTEMBER 1972
L55	LIT	CAPC	SEPTEMBER 1972
L57	LITH	LA	SEPTEMBER 1972
G60	M E	ENGR	SEPTEMBER 1972
N46	M E M	EMS	SEPTEMBER 1972
J87	M E R	HUMN	SEPTEMBER 1972
G62	M E T	CAPC	SEPTEMBER 1972
N56	M P E	EMS	SEPTEMBER 1972
S32	MA SC	CAPC	SEPTEMBER 1972
V13	MARSC	IDF	SEPTEMBER 1972
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S30	MATH	SCI	SEPTEMBER 1972
N33	MATSC	EMS	SEPTEMBER 1972
	MD ET	CAPC	SEPTEMBER 1972
M60	MED	MED	SEPTEMBER 1972
S40	MED T	SCI	SEPTEMBER 1972
L61	MEDVL	LA	SEPTEMBER 1972
N36	METAL	EMS	SEPTEMBER 1972
N40	METEO	EMS	SEPTEMBER 1972
E50	MGMT	BA	SEPTEMBER 1972
S55	MICRB	SCI	SEPTEMBER 1972
N60	MIN	EMS	SEPTEMBER 1972
N45	MIN E	EMS	SEPTEMBER 1972
N64	MIN P	EMS	SEPTEMBER 1972
E55	MKTG	BA	SEPTEMBER 1972
N44	MN EC	EMS	SEPTEMBER 1972
N52	MN PR	EMS	SEPTEMBER 1972
N72	MNG	EMS	SEPTEMBER 1972
N76	MNG E	EMS	SEPTEMBER 1972
N78	MNG T	EMS	SEPTEMBER 1972
S29	MSTAT	SCI	SEPTEMBER 1972
F53	MTHED	ED	SEPTEMBER 1972
F52	MU ED	ED	SEPTEMBER 1972
B60	MUSIC	A&A	SEPTEMBER 1972
W20	NAVY	ROTC	SEPTEMBER 1972
M62	NEUR	MED	SEPTEMBER 1972

Y30 NONE	NOND	SEPTEMBER 1972
J90 NU PH	HUMN	SEPTEMBER 1972
G65 NUC E	ENGR	SEPTEMBER 1972
J88 NURS	HUMN	SEPTEMBER 1972
J89 NUTR	HUMN	SEPTEMBER 1972
L63 O S	CAPC	SEPTEMBER 1972
M65 OBGYN	MED	SEPTEMBER 1972
S70 P M	SCI	SEPTEMBER 1972
N80 P N G	EMS	SEPTEMBER 1972
M70 PATH	MED	SEPTEMBER 1972
M72 PED	MED	SEPTEMBER 1972
H10 PH ED	HPER	SEPTEMBER 1972
S60 PH SC	SCI	SEPTEMBER 1972
M75 PHARM	MED	SEPTEMBER 1972
L60 PHIL	LA	SEPTEMBER 1972
V15 PHSIO	IDF	SEPTEMBER 1972
S65 PHYS	SCI	SEPTEMBER 1972
L64 PL SC	LA	SEPTEMBER 1972
N86 PLMSC	EMS	SEPTEMBER 1972
A70 PLTSC	AGRI	SEPTEMBER 1972
N84 PNG E	EMS	SEPTEMBER 1972
L62 POL	LA	SEPTEMBER 1972
L66 PORT	LA	SEPTEMBER 1972
A69 PPATH	AGRI	SEPTEMBER 1972
L68 PRE L	LA	SEPTEMBER 1972
L71 PS SC	CAPC	SEPTEMBER 1972
M80 PSCHT	MED	SEPTEMBER 1972
L70 PSY	LA	SEPTEMBER 1972
A72 PTYSC	AGRI	SEPTEMBER 1972
L72 PUB A	LA	SEPTEMBER 1972
L74 PUB S	LA	SEPTEMBER 1972
E58 Q B A	BA	SEPTEMBER 1972
E56 R EST	BA	SEPTEMBER 1972
V16 R PL	IDF	SEPTEMBER 1972
A78 R SOC	AGRI	SEPTEMBER 1972
M82 RADIO	MED	SEPTEMBER 1972
H30 RC PK	HPER	SEPTEMBER 1972
F64 REMED	ED	SEPTEMBER 1972
L76 RL ST	LA	SEPTEMBER 1972
J91 RTL	HUMN	SEPTEMBER 1972
L78 RUS	LA	SEPTEMBER 1972
L80 S CR	LA	SEPTEMBER 1972
G70 S E	ENGR	SEPTEMBER 1972
L84 S L L	LA	SEPTEMBER 1972
F80 S P A	ED	SEPTEMBER 1972
V18 S PSY	IDF	SEPTEMBER 1972
V25 S S S	IDF	SEPTEMBER 1972
V20 S T S	IDF	SEPTEMBER 1972
F68 SAFED	ED	SEPTEMBER 1972
S90 SC	SCI	SEPTEMBER 1972
F69 SCIED	ED	SEPTEMBER 1972
F70 SECED	ED	SEPTEMBER 1972
F74 SHORT	ED	SEPTEMBER 1972
L82 SLAV	LA	SEPTEMBER 1972
L86 SU SC	CAPC	SEPTEMBER 1972
L86 SU SC	LA	SEPTEMBER 1972
L88 SU ST	LA	SEPTEMBER 1972
L92 SOC	LA	SEPTEMBER 1972
L90 SOC W	LA	SEPTEMBER 1972
L95 SP ST	CAPC	SEPTEMBER 1972

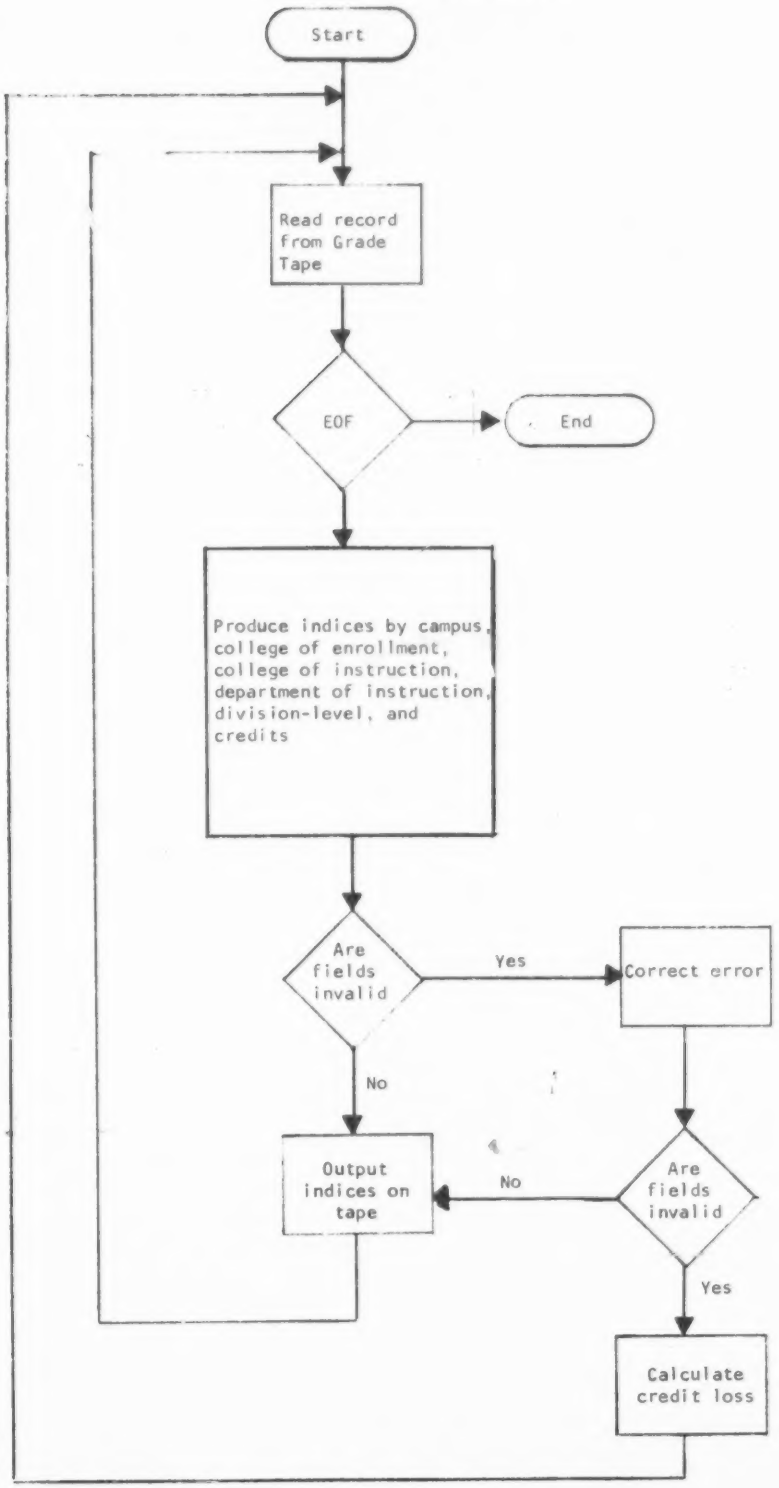
UT3H-4K

```
L94 SPAN        LA          SEPTEMBER 1972
L96 SPCH        LA          SEPTEMBER 1972
S76 SS ED       ED          SEPTEMBER 1972
S92 STAT        SCI         SEPTEMBER 1972
M90 SURG        MED         SEPTEMBER 1972
    I T         CAPC        SEPTEMBER 1972
B70 THEA        A&A         SEPTEMBER 1972
F82 TYP         ED          SEPTEMBER 1972
L98 UKR         LA          SEPTEMBER 1972
A81 V SC        AGRI        SEPTEMBER 1972
F86 VI ED       ED          SEPTEMBER 1972
A84 W L M       AGRI        SEPTEMBER 1972
A86 W S         AGRI        SEPTEMBER 1972
A85 WILDL       AGRI        SEPTEMBER 1972
    WR ET       CAPC        SEPTEMBER 1972
S96 ZOOL        SCI         SEPTEMBER 1972
A95 2 AGB       AGRI        SEPTEMBER 1972
E70 2 B A       BA          SEPTEMBER 1972
E68 2 BUS       BA          SEPTEMBER 1972
T20 2 DUC       COUN        SEPTEMBER 1972
G80 2 EET       ENGR        SEPTEMBER 1972
G81 2 MET       ENGR        SEPTEMBER 1972
J95 2 HFS       HUMN        SEPTEMBER 1972
V90 2 LAS       IDF         SEPTEMBER 1972
A97 2 LAT       AGRI        SEPTEMBER 1972
G83 2 M T       ENGR        SEPTEMBER 1972
L87 2 MCA       LA          SEPTEMBER 1972
L91 2 MCJ       LA          SEPTEMBER 1972
G88 2 MET       ENGR        SEPTEMBER 1972
G85 2 NET       ENGR        SEPTEMBER 1972
H90 2 R P       HPER        SEPTEMBER 1972
J97 2 RTL       HUMN        SEPTEMBER 1972
G90 2 SRT       ENGR        SEPTEMBER 1972
A99 2 WLT       AGRI        SEPTEMBER 1972
G71 2APCT       ENGR        SEPTEMBER 1972
G72 2ASET       ENGR        SEPTEMBER 1972
G73 2CHET       ENGR        SEPTEMBER 1972
S97 2CPSC       SCI         SEPTEMBER 1972
A98 2FORT       AGRI        SEPTEMBER 1972
N90 2MATT       EMS         SEPTEMBER 1972
L89 2MCRB       LA          SEPTEMBER 1972
N92 2MNGT       EMS         SEPTEMBER 1972
/*MESSAGE EOJ
//
//              TAPE=BMT16,IN
//DATA.FT10F001 DD DSN=INDEX,UNIT=2400,VOL=SER=BMT16,DCB=(RECFM=FB,
//  LRECL=28,BLKSIZE=7000)
//DATA.FT11F001 DD DSN=CREDIT,UNIT=2400,VOL=SER=BMT12,DCB=(RECFM=FB,
//    LRECL=458,BLKSIZE=3206)
//  DD DSN=CREDIT,UNIT=2400,VOL=SER=BMT13,DCB=(RECFM=FB,LRECL=458,
//  BLKSIZE=3206)
//  DD DSN=RADE.CRSREC.SPR72,UNIT=2400,VOL=SER=BMT14,DCB=(RECFM=FB,
//  LRECL=458,BLKSIZE=3206)
//
```

JCL

FIGURE A-1

MACRO FLOW CHART FOR INDEX-1



```
//              'UBISM,T=2000,K=30000','TALLEMS U.N.C.',MSGLEVEL=2
//              TAPE=BMT7,OUT                                                  UISM=4K
//              END OF TAPE CARDS
//INDEX EXEC FGCG
//SOURCE.INPUT DD *
C     FIFTH 11/21/72 -- FIFI # VERSION 2.12 #                                  00000002
C                                                                              00000004
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC00000006
C                                                                              00000008
C       THIS IS THE FIRST MODULE OF THE CREDIT HOUR MODEL.  IT USES            00000010
C       STUDENT GRADE TAPES AS INPUT.                                          00000012
C                                                                              00000014
C       THIS SECTION OF THE PROJECT IS DESIGNED TO RETRIEVE A                  00000016
C       RECORD FROM THE TAPE AND CONVERT CERTAIN FIELDS OF THE                 00000018
C       RECORD INTO INDICES WHICH CAN BE HANDLED EASILY BY THE SORT            00000020
C       PROGRAM WHICH IS THE NEXT PART OF THE PROJECT.  THE PROGRAM            00000022
C       IS WRITTEN TO GIVE EFFICIENCY AND SPEED BUT NOT NECESSARILY            00000024
C       COMPACT AND CONCISE CODE.  THEREFORE, SUBROUTINES AND SUB-             00000026
C       FUNCTION PROGRAMS ARE ELIMINATED AND ALL CODE IS IN-LINE.              00000028
C                                                                              00000030
C       THERE ARE MANY TABLES, ARRAYS AND POINTERS USED TO HOLD                00000032
C       INITIALIZATION INFORMATION, INDICES AND RECORD FIELDS.                 00000034
C       SOME OF THESE ARE DEFINED AS FOLLOWS:                                  00000036
C                                                                              00000038
C                                                                              00000040
C            REC===>A STRING TO HOLD THE UNPROCESSED RECORD AS                 00000042
C                   ACCESSED FROM THE TAPE                                     00000044
C                                                                              00000046
C            CAM, ENROLL, TAKEN, COULEV, CREDIT, TERM, AND SLEV                00000048
C            ===>THESE STRINGS ARE USED TO KEEP VARIOUS FIELDS OF              00000050
C                INTEREST IN THE RECORD                                        00000052
C                                                                              00000054
C            CAMPUS===>A LIST OF CAMPUS CODES.  A SEQUENTIAL SEARCH            00000056
C                      IS PERFORMED WITH THIS LIST TO DETERMINE                00000058
C                      THE CAMPUS IN THE RECORD                                00000060
C                                                                              00000062
C            TAK===>A LIST OF COLLEGE CODES USED FOR COLLEGE OF                00000064
C                   ENROLLMENT AND THE COLLEGE IN WHICH A COURSE IS            00000066
C                   TAKEN                                                      00000068
C                                                                              00000070
C            INDEX===>THIS ARRAY IS USED TO KEEP A SET OF NINE                 00000072
C                     INDICES WHICH ARE EXTRACTED FROM THE RECORD              00000074
C                                                                              00000076
C            DEPT===>A TABLE USED TO FIND THE DEPARTMENT NUMBER BY             00000078
C                   USING A COLLEGE CODE INDEX AND A DEPARTMENT                00000080
C                   INDEX.                                                     00000082
C                                                                              00000084
C            COLL===>AN ARRAY OF POINTERS.  ELEMENT I OF THE ARRAY             00000086
C                   POINTS TO WHERE THE LIST OF DEPARTMENTS IN                 00000088
C                   COLLEGE(I) STARTS IN THE ARRAY DEP                         00000090
C            THE FOLLOWING THREE LISTS ARE USED FOR OUTPUT ONLY AND            00000092
C            ARE NOT MANDATORY FOR THE PROPER FUNCTIONING OF THE               00000094
C            PROGRAM                                                           00000096
C                                                                              00000098
C            DEP===>THIS HOLDS A LIST OF ALL COLLEGES AT THE UNIVER-           00000100
C                   SITY AND THE RESPECTIVE LISTS OF DEPARTMENTS               00000102
C                   FOR EACH COLLEGE                                           00000104
      CONTINUE
C                                                                              00000106
C            CAMP===>LIST OF ALL CAMPUS NAMES                                  00000108
```

```
C
C          SILEV===>THIS LIST IS INITIALIZED TO HOLD THE FIVE
C                   STUDENT LEVELS
C
C
C     AT EACH STAGE OF PROCESSING, CHECKS ARE MADE TO INSURE
C     THAT THE DATA IS VALID
C
C     FREQUENTLY IN THE EXECUTION OF THE PROGRAM, WE CALL A SUB-
C     ROUTINE, 'EDCHIN', WHICH IS USED TO CONVERT A NUMBER FROM
C     CHARACTER FORM TO INTEGER FORM.
C
C     THERE ARE TWO SETS OF CODES USED IN THE PROGRAM.  THE FIRST
C     IS THE STUDENT LEVEL CODE WHICH HAS FIVE COMPONENTS.
C     THEY ARE:
C
C          STUDENT LEVEL          TYPE OF STUDENT
C             1    ===>            GRADUATE
C             2    ===>            ASSOCIATE DEGREE
C             3    ===>            LOWER DIVISION
C             4    ===>            UPPER DIVISION
C             5    ===>            ADJUNCT
C
C     THE SECOND CODE IS FOR COURSE LEVELS.  AGAIN THERE ARE FIVE
C     CLASSIFICATIONS WHICH ARE:
C
C          COURSE LEVEL           COURSE NUMBER
C             1    ===>              0 - 399
C             2    ===>              400 - 499
C             3    ===>              500 - 599
C             4    ===>              600 - 699
C             5    ===>              800 - 899
C
C     AS WE MENTIONED BEFORE, THIS PROGRAM PRODUCES A SET OF SEVEN
C     INDICES TO BE USED LATER.  THESE INDICES ARE AS FOLLOWS:
C
C       INDEX NUMBER           INFORMATION IN INDEX
C          INDEX(1) ===>          CAMPUS INDEX
C          INDEX(2) ===>          NUMBER OF COLLEGE OF ENROLLMENT
C          INDEX(3) ===>          COURSE LEVEL INDICATOR
C          INDEX(4) ===>          INDEX TO COLLEGE TAKEN
C          INDEX(5) ===>          INDEX TO DEPARTMENT TAKEN
C          INDEX(6) ===>          NUMBER OF CREDITS TAKEN
C          INDEX(7) ===>          STUDENT LEVEL INDICATOR
C
C     THREE SWITCHES ARE USED TO CONTROL PORTIONS OF THE PROGRAM.
C     THEY ARE
C          SWITCH ONE CONTROLS PRINTING OF INFORMATION
C          SWITCH TWO AND THREE ARE USED IN KEEPING A COUNT OF THE
C          NUMBER OF CREDITS LOST DUE TO ERRORS IN THE RUN
C
C
CCCC
```

```
      INTEGER INDMAX(7)/22,16,5,16,21,999,5/                                    00000230
      LOGICAL*1 SLEV,CAMPUS(50),TAK(16),NUMB(10),TERM(2),CHIN(36)               00000232                    UT3H-4K
      LOGICAL*1 TITLE(5,500),CODE(3,500),ZERO                                   00000234
      LOGICAL*1 REC(458),CAM(2),ENROLL(3),TAKEN(3),COLLEV(3),CREDIT(3)          00000236
      LOGICAL*1 DEP(141,16),CAMP(22,16),STLEV(5,16),BUFF(16),A                  00000238
      LOGICAL*4 CEO,CLT                                                         00000240
      INTEGER*4 INDEX(9),DEPT(99,16),COLL(16),CAP(15,4)                         00000242
      EQUIVALENCE (SLEV,REC(1)),(CAM(1),REC(41)),(ENROLL(1),REC(58))            00000244
      EQUIVALENCE (TERM(1),REC(31))                                             00000246
      DATA CAMPUS/3*'A','N','R','D','B','K','B','R','C','L','O','E','D',00000248
     1'S','F','E','H','N','K','P','R','A','M','K','N','K','O','Z','S','L00000250
     2','S','N','S','O','O','P','W','R','Y','K','H','Y','N','4','O','C',00000252
     3'S','A'/                                                                  00000254
      DATA TAK/'A','M','F','F','G','H','J','L','M','N','S','V','W','T','00000256
     1C','Y'/                                                                   00000258
      DATA ZERO/'0'/                                                            00000260
      DATA NUMB,A/'0','1','2','3','4','5','6','7','8','9','0'/                 00000262
      DATA CAP/20,21,34,42,59,68,71,72,79,80,87,88,105,113,0,44,47,48,490000264
     1,50,51,52,53,54,56,110,117,118,121,57,19,25,26,27,29,30,32,125,0,00000266
     2,0,0,0,0,0,119,14*0/                                                      00000268
C     FORMAT TO PRINT OUT THE INDEXES                                           00000270
  100 FORMAT (8I10)                                                             00000272
C     FORMAT USED IN ERROR HANDLER                                              00000274
C     ERROR 8 - SYSTEM ERROR                                                    00000276
  102 FORMAT ('0$$$$$$$$$$$$$$   INDEX ERROR   $$$$$$$$$$$$$')                 00000278
  104 FORMAT (5X,15I5)                                                          00000280
  106 FORMAT (16A1)                                                             00000282
  108 FORMAT (I2,16A1)                                                          00000284
  110 FORMAT ('0***ERROR***INVALID CAMPUS CODE',/,' THE CAMPUS FIELD= <'00000286
     1,2A1,'>')                                                                 00000288
  112 FORMAT ('0***ERROR***INVALID COLLEGE OF ENROLLMENT CODE',/,' THE  00000290
     1 ENROLLMENT FIELD= <',3A1,'>')                                            00000292
  114 FORMAT ('0***ERROR***INVALID COLLEGE TAKEN CODE',/,' THE COLLEGE  00000294
     1 TAKEN FIELD= <',3A1,'>')                                                 00000296
  116 FORMAT ('0***ERROR***INVALID CODE FOR COURSE NUMBER',/,' THE COURS00000298
     1E NUMBER FIELD= <',3A1,'>')                                               00000300
  118 FORMAT ('0***ERROR***INVALID CODE FOR CREDIT',/,' THE CREDIT FIELD00000302
     1 = <',3A1,'>')                                                            00000304
  120 FORMAT ('0***ERROR ***INVALID CODE FOR STUDENT LEVEL',/,' THE STU00000306
     1DENT LEVEL CODE= <',A1,'> AND THE TERM FIELD= <',2A1,'>')                 00000308
  122 FORMAT ('0***ERROR***COLLEGE CODE OF <C> FOUND AT ',16A1)         00000310
  124 FORMAT ('0','THE TOTAL NUMBER OF ERRORS IN THIS RUN=  ',I4)       00000312
  126 FORMAT ('0','THE TOTAL NUMBER OF CREDITS LOST DUE TO ERRORS IN DA00000314
     1 A IN THIS RUN= ',I4)                                                     00000316
  128 FORMAT ('0',20X,'CURRENTLY PROCESSING RECORD NUMBER',I5)          00000318
  130 FORMAT ('0',10X,19A1,10X,3A1,'-',2A1,'-',4A1,10X,16)              00000320
  132 FORMAT ('1',15X,'CREDIT CHANGES MADE FOR FOLLOWING STUDENTS',//,16X00000322
     1X,'FOR WINTER AND SPRING TERMS 1972',//,16X,'NAME',15X,'STUDENT NU00000324
     2MBER',12X,'CREDITS PROCESSED')                                            00000326
C                                                                               00000328
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC 00000330
C                                                                               00000332
C        INITIALIZATION, BUILDING OF TABLES AND SETTING OF SWITCHES             00000334
C                                                                               00000336
C        THIS PORTION OF THE PROGRAM IS VERY IMPORTANT SO WE GIVE A             00000338
C        SLIGHTLY MORE DETAILED VIEW HERE.                                      00000340
C                                                                               00000342
C        THERE ARE THREE SWITCHES USED AS FOLLOWS:                              00000344
C             IS1 ===>  SET TO ON WHEN THE END OF THE INPUT FILE IS             00000346
C                       FOUND, THUS INDICATING THAT ALL FINAL PRINTING          00000348
```

```
C                       AND BOOKEEPING IS TO BE DONE AND THE PROGRAM     00000350
C                       TERMINATED.                                      00000352
C                                                                        00000354
C              IS2 ===> USED IN PROCESSING CAPITOL CAMPUS.  IF CREDIT    00000356
C                       FIELD IS IN UNITS, THE SWITCH IS SET TO ON TO    00000358
C                       INDICATE THAT THIS NUMBER SHOULD BE CONVERTED    00000360
C                       TO CREDITS BEFORE PROCEEDING.                    00000362
C                                                                        00000364
C              IS3 ===> USED IF AN ERROR OCCURS AND WE WANT TO PROCESS   00000366
C                       THE REST OF THE RECORD TO FIND HOW MANY CREDITS  00000368
C                       WERE LOST DUE TO THIS ERROR.                     00000370
C                                                                        00000372
C                                                                        00000374
C        ALSO, THREE COUNTERS ARE USED.                                  00000376
C             ICRED ===>COUNTS CREDITS LOST DUE TO ERROR                 00000378
C             IREC ===> COUNTS NUMBER OF RECORDS PROCESSED               00000380
C             IERR ===> COUNTS NUMBER OF ERRORS FOUND IN RECORDS         00000382
C                                                                        00000384
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC 00000386
C                                                                        00000388
      WRITE (6,132)                                                      00000390
      ZPRNT=.TRUE.
      ZERO=.TRUE.
      IS1=0                                                              00000392
      IS2=0                                                              00000394
      IS3=0                                                              00000396
      ICRED=0                                                            00000398
      IERR=0                                                             00000400
      IREC=0                                                             00000402
C                                                                        00000404
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC 00000406
C                                                                        00000408
C        HERE WE READ IN THE DEPT MATRIX,  THE CAMPUS NAMES, AND THE     00000410
C        STUDENT LEVEL NAMES.                                            00000412
C                                                                        00000414
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC 00000416
C                                                                        00000418
      DEPT(5,16)=1                                                       00000420
      DEPT(30,16)=2                                                      00000422
      DEPT(91,16)=3                                                      00000424
      DO 134  I=1,99                                                     00000426
      READ (5,104) (DEPT(I,J),J=1,13)                                    00000428
      DEPT(I,15)=1                                                       00000430
  134 DEPT(I,14)=1                                                       00000432
      DO 136  I=1,22                                                     00000434
  136 READ (5,106) (CAMP(I,J),J=1,16)                                    00000436
      DO 138  I=1,5                                                      00000438
  138 READ (5,106) (STLEV(I,J),J=1,16)                                   00000440
C                                                                        00000442
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC 00000444
C                                                                        00000446
C        READ IN ALL OF THE DEPARTMENT NAMES UNDER EACH COLLEGE.  THIS   00000448
C        TABLE IS USED FOR OUTPUT FORMATING.                             00000450
C                                                                        00000452
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC 00000454
C                                                                        00000456
      M=1                                                                00000458
      ICOL=1                                                             00000460
      IPTR=2                                                             00000462
  140 I=0                                                                00000464
```

```
      GO TO 144                                                          00000466
  142 I=J                                                                00000468
  144 READ (5,108,END=156) J,(BUFF(L),L=1,16)                            00000470
      IF (I.EQ.J) GO TO 150                                              00000472
      DO 146  L=1,16                                                     00000474
  146 DEP(IPTR,L)=BUFF(L)                                                00000476
      WRITE (6,148) J,IPTR,(DEP(IPTR,L),L=1,16)                          00000478
  148 FORMAT (' ',I2,5X,'IPTR=',I5,5X,16A1)                              00000480
      IPTR=IPTR+1                                                        00000482
      GO TO 142                                                          00000484
  150 DO 152  L=1,16                                                     00000486
  152 DEP(ICOL,L)=BUFF(L)                                                00000488
      COLL(M)=ICOL                                                       00000490
      WRITE (6,154) J,ICOL,(DEP(ICOL,L),L=1,16),M,COLL(M)                00000492
  154 FORMAT (' ',I2,5X,'ICOL=',I5,5X,16A1,5X,'M=',I3,5X,'COLL(M)=',I5)  00000494
      ICOL=IPTR                                                          00000496
      IPTR=IPTR+1                                                        00000498
      M=M+1                                                              00000500
      GO TO 140                                                          00000502
C                                                                        00000504
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC 00000506
  156 CONTINUE                                                           00000508
C                                                                        00000510
COMMENT: READ IN TITLE CARDS.                                            00000512
C                                                                        00000514
      I=0                                                                00000516
  158 I=I+1                                                              00000518
      READ (5,160,END=168) (CODE(J,I),J=1,3),(TITLE(J,I),J=1,5)          00000520
  160 FORMAT (3A1,1X,5A1)                                                00000522
      WRITE (6,162) I,(CODE(J,I),J=1,3),(TITLE(J,I),J=1,5)               00000524
  162 FORMAT (' ',I3,5X,'CODE=',3A1,5X,'TITLE=',5A1)                     00000526
      IF (I.EQ.1) GO TO 158                                              00000528
      IF (CLT(TITLE(1,I),TITLE(1,I-1),5)) GO TO 164                      00000530
      GO TO 158                                                          00000532
  164 WRITE (6,166) I                                                    00000534
  166 FORMAT ('0TITLE CARD OUT OF ORDER',5X,'CARD=',I5)                  00000536
      GO TO 158                                                          00000538
  168 NUMREC=I-1                                                         00000540
C                                                                        00000542
C     INPUT DATA                                                         00000544
C                                                                        00000546
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC 00000548
C                                                                        00000550
  170 CONTINUE                                                           00000552
      CALL GET (71,REC,458,KEY)                                          00000554
      IF (KEY.EQ.1) GO TO 298                                            00000556
      IREC=IREC+1                                                        00000558
      IF (ZECHO) CALL ECHO (IREC,REC,9,INDEX,CAMP,STLEV,DEP,COLL)        00001038
      IF (.NOT.ZECHO.AND.MOD(IREC,1000).EQ.0) WRITE (9,128) IREC         00000560
C                                                                        00000562
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC 00000564
C                                                                        00000566
C        THE VARIABLE NUM CONTAINS THE NUMBER OF COURSES WE ARE TO       00000568
C        PROCESS IN THIS RECORD                                          00000570
C                                                                        00000572
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC 00000574
C                                                                        00000576
      CALL EDCHIN (REC(47),NUM,2)                                        00000578
      K=0                                                                00000580
C                                                                        00000582
```

```
CCCC
```

```
C         ENROLLMENT BUT ALSO AN INDEX FOR THE DEPARTMENT OF ENROLLMENT   00000702
C                                                                         00000704
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC00000706
C                                                                         00000708
  192 DO 194  I=1,16                                                      00000710
      IF (CEQ(ENROLL(1),TAK(I),1)) GO TO 196                              00000712
  194 CONTINUE                                                            00000714
      N=2                                                                 00000716
      GO TO 264                                                           00000718
C         CAPITOL MAJOR COURSES CAN ONLY BE TAKEN AT CAPITOL
  196 IF ((I.EQ.15).AND.(INDEX(1).NE.6)) GO TO 262                        00000720
      INDEX(2)=I                                                          00000722
COMMENT: CORRECT COMMON KEYPUNCH MISTAKE OF LETTER'O' FOR NUMBER '0'.     00000724
      IF (CEQ(ENROLL(2),'O',1)) ENROLL(2)=ZERO                            00000726
      DO 198  I=1,10                                                      00000728
      IF (CEQ(ENROLL(2),NUMB(I),1)) GO TO 200                             00000730
  198 CONTINUE                                                            00000732
      N=2                                                                 00000734
      GO TO 264                                                           00000736
  200 DO 202  I=1,10                                                      00000738
      IF (CEQ(ENROLL(3),NUMB(I),1)) GO TO 204                             00000740
  202 CONTINUE                                                            00000742
      N=2                                                                 00000744
      GO TO 264                                                           00000746
  204 CALL EDCHIN (ENROLL(2),NUM1,2)                                      00000748
COMMENT: CHECK FOR INVALID INDEX ZERO.                                    00000750
      N=2                                                                 00000752
      IF (NUM.EQ.0.OR.INDEX(2).EQ.0) GO TO 264                            00000754
      INDEX(9)=DEPT(NUM1,INDEX(2))                                        00000756
C                                                                         00000758
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC00000760
C                                                                         00000762
C         IF SWITCH IS1 IS ON(1), WE PRINT OUT PERTINENT INFORMATION      00000764
C         FOUND THUS FAR.  ALL COURSE INFORMATION IS OUTPUT AS EACH       00000766
C         COURSE IS PROCESSED.                                            00000768
C                                                                         00000770
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC00000772
      CONTINUE                                                            00000774
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC00000776
C                                                                         00000778
C         HERE WE BEGIN A LOOP TO PROCESS THE NUM COURSES OF THE RECORD   00000780
C         THE NEXT BIT OF INFORMATION WE NEED FROM THIS COURSE IS         00000782
C         THE NUMBER OF CREDITS.  A CHECK IS MADE TO SEE IF THIS MAY      00000784
C         BE IN UNITS FROM CAPITOL CAMPUS.                                00000786
C                                                                         00000788
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC00000790
C                                                                         00000792
  206 J=K*41                                                              00000794
      CREDIT(1)=REC(J+81)                                                 00000796
      CREDIT(2)=REC(J+82)                                                 00000798
      CREDIT(3)=REC(J+83)                                                 00000800
C         THE '#' IS USED TO INDICATE CAPITOL UNITS
      IF (CEQ(CREDIT(1),'#',1)) GO TO 210                                 00000802
COMMENT: CHECK FOR AUDIT.                                                 00000804
      IF (CEQ(CREDIT(1),'AUD',3)) GO TO 222                               00000806
      DO 208  I=1,10                                                      00000808
      IF (CEQ(CREDIT(1),NUMB(I),1)) GO TO 212                             00000810
  208 CONTINUE                                                            00000812
      N=5                                                                 00000814
      GO TO 264                                                           00000816
```

```
  210 IS2=1                                                                 00000818
  212 DO 214  I=1,10                                                        00000820
      IF (CEQ(CREDIT(2),NUMB(I),1)) GO TO 216                               00000822
  214 CONTINUE                                                              00000824
      N=5                                                                   00000826
      GO TO 264                                                             00000828
  216 DO 218  I=1,10                                                        00000830
C        CHANGE '#' TO ZERO CHARACTER
C        CONVERT CAPITOL UNITS TO CREDITS
      IF (CEQ(CREDIT(3),NUMB(I),1)) GO TO 220                               00000832
  218 CONTINUE                                                              00000834
      N=5                                                                   00000836
      GO TO 264                                                             00000838
  220 IF (IS2.EQ.1) CREDIT(1)=A                                             00000840
      CALL EDCHIN (CREDIT(1),INDEX(6),2)                                    00000842
      IF ((IS2.EQ.1).AND.(INDEX(2).EQ.15).AND.((INDEX(7).EQ.3).OR.(INDEX    00000844
     1(7).EQ.4))) INDEX(6)=INDEX(6)*4                                       00000846
      IS2=0                                                                 00000848
      IF (IS3.EQ.0) GO TO 224                                               00000850
      ICRED=ICRED+INDEX(6)                                                  00000852
      K=K+1                                                                 00000854
      NUM=NUM-1                                                             00000856
      IF (NUM.NE.0) GO TO 206                                               00000858
      IS3=0                                                                 00000860
      GO TO 170                                                             00000862
COMMENT: ALL AUDITS CONVERTED TO THREE CREDITS.                             00000864
  222 INDEX(6)=3                                                            00000866
C                                                                           00000868
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC00000870
C                                                                           00000872
C        FIRST THE INDICES ARE FOUND FOR THE COLLEGE AND DEPARTMENT         00000874
C        IN WHICH THE COURSE IS TAKEN                                       00000876
C                                                                           00000878
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC00000880
C                                                                           00000882
  224 TAKEN(1)=REC(J+54)                                                    00000884
      TAKEN(2)=REC(J+55)                                                    00000886
      TAKEN(3)=REC(J+56)                                                    00000888
      DO 226  I=1,13                                                        00000890
      IF (CEQ(TAKEN(1),TAK(I),1)) GO TO 228                                 00000892
  226 CONTINUE                                                              00000894
      N=3                                                                   00000896
      GO TO 264                                                             00000898
  228 INDEX(4)=I                                                            00000900
      DO 230  I=1,10                                                        00000902
      IF (CEQ(TAKEN(2),NUMB(I),1)) GO TO 232                                00000904
  230 CONTINUE                                                              00000906
      N=3                                                                   00000908
      GO TO 264                                                             00000910
  232 DO 234  I=1,10                                                        00000912
      IF (CEQ(TAKEN(3),NUMB(I),1)) GO TO 236                                00000914
  234 CONTINUE                                                              00000916
      N=3                                                                   00000918
      GO TO 264                                                             00000920
  236 CALL EDCHIN (TAKEN(2),NUM1,2)                                         00000922
      N=3                                                                   00000924
      INDEX(5)=DEPT(NUM1,INDEX(4))                                          00000926
      IF (INDEX(5).EQ.0) GO TO 264                                          00000928
C                                                                           00000930
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC00000932
```

```
C                                                                       00000934
C         NOW WE FIND THE COURSE NUMBER AND FROM THIS, WE CAN           00000936
C         DETERMINE THE COURSE LEVEL INDEX                              00000938
C         IF SWITCH ISI IS ON(1), THE COURSE INFORMATION IS PRINTED      00000940
C                                                                       00000942
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC00000944
C                                                                       00000946
      COULEV(1)=REC(J+57)                                               00000948
      COULEV(2)=REC(J+58)                                               00000950
      COULEV(3)=REC(J+59)                                               00000952
      DO 238  I=1,10                                                    00000954
      IF (CEQ(COULEV(1),NUMB(I),1)) GO TO 240                           00000956
  238 CONTINUE                                                          00000958
      N=4                                                               00000960
      GO TO 264                                                         00000962
  240 DO 242  I=1,10                                                    00000964
      IF (CEQ(COULEV(2),NUMB(I),1)) GO TO 244                           00000966
  242 CONTINUE                                                          00000968
      N=4                                                               00000970
      GO TO 264                                                         00000972
  244 DO 246  I=1,10                                                    00000974
      IF (CEQ(COULEV(3),NUMB(I),1)) GO TO 248                           00000976
  246 CONTINUE                                                          00000978
      N=4                                                               00000980
      GO TO 264                                                         00000982
  248 CALL EDCMIN (REC(J+57),INDEX(8),3)                                00000984
      IF ((INDEX(6).NE.0).OR.((INDEX(8).NE.601).AND.(INDEX(8).NE.611))) 00000986
     1GO TO 250                                                         00000988
C         GIVE 601 AND 611 COURSES CREDITS AND LIST STUDENTS
      IF (INDEX(8).EQ.601) INDEX(6)=8                                   00000990
      IF (INDEX(8).EQ.611) INDEX(6)=3                                   00000992
      WRITE (8,130) (REC(I),I=2,20),(REC(I),I=22,30),INDEX(6)           00000994
  250 NUM1=INDEX(8)/100                                                 00000996
      INDEX(3)=1                                                        00000998
      IF (NUM1.EQ.8) INDEX(3)=5                                         00001000
      IF (NUM1.EQ.6) INDEX(3)=4                                         00001002
      IF (NUM1.EQ.5) INDEX(3)=3                                         00001004
      IF (NUM1.EQ.4) INDEX(3)=2                                         00001006
C         REGROUP CAPITOL DEPARTMENTS
      IF (INDEX(1).NE.6) GO TO 256                                      00001008
      L=COLL(INDEX(4))+INDEX(5)                                         00001010
      DO 252  J=1,4                                                     00001012
      DO 252  K1=1,15                                                   00001014
      IF (L.EQ.CAP(K1,J)) GO TO 254                                     00001016
  252 CONTINUE                                                          00001018
  254 INDEX(5)=J                                                        00001020
      INDEX(4)=15                                                       00001022
  256 CONTINUE                                                          00001024
      N=8                                                               00001026
      DO 258  IJK=1,7                                                   00001028
      IF (INDEX(IJK).LT.INDMIN(IJK)) GO TO 264                          00001030
      IF (INDEX(IJK).GT.INDMAX(IJK)) GO TO 264                          00001032
  258 CONTINUE                                                          00001034
      CALL PUT (10,INDEX,28,KEY)                                        00001036
      IF (ZPRNT) WRITE (9,100) IREC,(INDEX(IJK),IJK=1,7)                00001040
      IF(ZPRNT)WRITE(9,1004)IREC,(CAMP(INDEX(1),J),J=1,16),
     1(DEP(COLL(INDEX(2)),J),J=1,16),INDEX(3),(DEP(COLL(INDEX(4)),J),J=1
     2,16),(DEP(COLL(INDEX(4))+INDEX(5),J),J=1,16),INDEX(6),
     3 (STLEV(INDEX(7),J),J=1,16)
 1004  FORMAT('0IREC=',I6,3X,16A1,3X,'ENROLL=',16A1,3X,'COURSE LEVEL=',
```

```
     1 13,/,' ','COLL TAKEN=',16A1,3X,'DEPT TAKEN=',16A1,3X,'CREDITS='
     2 ,I3,3X,'STUDENT LEVEL=',16A1)                                          00001042
C                                                                             00001044
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC00001046
C                                                                             00001048
C         THE INDICES ARE COLLECTED AND PUT ON                                00001050
C         DISK FOR THE SORT PROGRAM, THE NEXT PORTION OF THE PROJECT.         00001052
C                                                                             00001054
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC00001056
C                                                                             00001058
  260 K=K+1                                                                   00001060
      NUM=NUM-1                                                               00001062
      IF (NUM) 170,170,206                                                    00001064
  262 N=7                                                                     00001066
C                                                                             00001068
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC00001070
C                                                                             00001072
C         THIS IS THE ERROR SECTION FROM WHICH ERROR MESSAGES ARE             00001074
C         GENERATED BY MEANS OF A COMPUTED GOTO                               00001076
C                                                                             00001078
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC00001080
C                                                                             00001082
  264 CONTINUE                                                                00001084
      GO TO (266,268,270,288,290,292,294,296), N                              00001086
  266 WRITE (6,110) (CAM(I),I=1,2)                                            00001088
      IERR=IERR+1                                                             00001090
      IS3=1                                                                   00001092
      GO TO 206                                                               00001094
  268 WRITE (6,112) (ENROLL(I),I=1,3)                                         00001096
      IERR=IERR+1                                                             00001098
      IS3=1                                                                   00001100
      GO TO 206                                                               00001102
C                                                                             00001104
COMMENT: BINARY SEARCH COURSE CODE CORRECTION ROUTINE.                        00001106
C                                                                             00001108
  270 WRITE (6,114) (TAKEN(I),I=1,3)                                          00001110
      I=1                                                                     00001112
      L=2                                                                     00001114
  272 KOUNT=((I*NUMBER)/L)+1                                                  00001116
      I=I*2                                                                   00001118
      CALL CHCOMP (REC(J+49),TITLE(1,KOUNT),5,&274,&280,&276)                 00001120
  274 I=I-1                                                                   00001122
      GO TO 278                                                               00001124
  276 I=I+1                                                                   00001126
  278 IF (L.GT.NUMBER) GO TO 284                                              00001128
      L=L*2                                                                   00001130
      GO TO 272                                                               00001132
  280 DO 282  I=1,3                                                           00001134
      REC(J+53+I)=CODE(I,KOUNT)                                               00001136
  282 CONTINUE                                                                00001138
      GO TO 224                                                               00001140
  284 WRITE (6,286) (REC(J+48+I),I=1,5)                                       00001142
  286 FORMAT ('0THIS KEY IS NOT VALID:',5X,5A1)                               00001144
      IERR=IERR+1                                                             00001146
      ICRED=ICRED+INDEX(6)                                                    00001148
      GO TO 260                                                               00001150
  288 WRITE (6,116) (COOLEV(I),I=1,3)                                         00001152
      IERR=IERR+1                                                             00001154
      ICRED=ICRED+INDEX(6)                                                    00001156
      GO TO 260
```

```
  290 WRITE (6,118) (CREDIT(I),I=1,3)
      IERR=IERR+1
      ICRED=ICRED+3
      GO TO 260
  292 WRITE (6,120) SLEV,(TERM(I),I=1,2)
      IERR=IERR+1
      IS3=1
      GO TO 206
  294 WRITE (6,122) (CAMP(INDEX(1),L),L=1,16)
      IERR=IERR+1
      IS3=1
      GO TO 206
  296 WRITE (6,102)
      IERR=IERR+1
      WRITE (6,100) IREC,(INDEX(IJK),IJK=1,7)
      GO TO 260
  298 WRITE (6,124) IERR
      WRITE (6,126) ICRED
      STOP
      END
C     FIFIED 11/21/72 -- FIF1 = VERSION 2.12 *
      SUBROUTINE ECHO (IREC,REC,J,INDEX,CAMP,SLEV,DEP,COLL)
      LOGICAL*1 DEP(141,16),CAMP(22,16),SLEV(5,16)
      INTEGER INDEX(7),COLL(16)
      LOGICAL*1 REC(458)
      LOGICAL*1 FMT(5000)/5000*' '/,FLAG/.FALSE./
      IF (FLAG) GO TO 102
      FLAG=.TRUE.
      READ (99,100,END=102) FMT
  100 FORMAT (6X,66A1)
  102 CONTINUE
      WRITE (J,FMT) IREC,REC
      RETURN
      END
//DATA.FT99F001 DD *
      ('1RECORD ',I10,
     X/' ',
     X' STUDENT TYPE            ',
     X 1  A1,20X,
     X/' ',
     X' NAME                    ',
     X  19 A1,20X,
     X/' ',
     X' SEX                     ',
     X  1  A1,20X,
     X/' ',
     X' STUDENT ID              ',
     X  9  A1,20X,
     X/' ',
     X' TERM STANDING           ',
     X  2  A1,20X,
     X/' ',
     X' DEPT OF ENROLLMENT      ',
     X  5  A1,20X,
     X/' ',
     X' COLLEGE OF ENROLLMENT   ',
     X  3  A1,20X,
     X/' ',
     X' CAMPUS CODE             ',
     X  2  A1,20X,
```

00001160 00001162 00001164 00001166 00001168 00001170 00001172 00001174 00001176 00001178 00001180 00001182 00001184 00001186 00001188 00001190 00001192 00001194 00001196 00001198 00001200 00001202 00001204 00001206 00001208 00001210 00001212 00001214 00001216 00001218 00001220 00001222 00001224

```
      X/' ',
      X'                              ',
      X  1  A1,20X,
      X/' ',
      X' GRADE REPORT INDICATOR       ',
      X  1  A1,20X,
      X/' ',
      X' INDICATOR                    ',
      X  1  A1,20X,
      X/' ',
      X' FULL OR PART TIME            ',
      X  1  A1,20X,
      X/' ',
      X'                              ',
      X  2  A1,20X,
      X/' ',
      X5(
      X' COURSE NAME                  ',
      X  5  A1,20X,
      X/' ',
      X' COURSE CODE                  ',
      X  3  A1,20X,
      X/' ',
      X' COURSE NUMBER                ',
      X  4  A1,20X,
      X/' ',
      X' SECTION                      ',
      X  2  A1,20X,
      X/' ',
      X' COURSE TITLE                 ',
      X  1H A1,20X,
      X/' ',
      X' CREDITS                      ',
      X  3  A1,20X,
      X/' ',
      X' GRADE                        ',
      X  2  A1,20X,
      X/' ',
      X' INDICATOR                    ',
      X  1  A1,20X,
      X/' ',
      X' LAST UPDATE                  ',
      X  3  A1,20X,
      X/' ',
      X))
/*          THIS IS A SLASH ASTERISK CARD
//DATA.FT71F001 DD UNIT=(2400,,DEFER),VOL=SER=BM17,DSN=BM17
//DATA.FT08F001 DD DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1331,SYSOUT=A
//DATA.FT09F001 DD DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1331,SYSOUT=A
//DATA.FT10F001 DD DUMMY
```

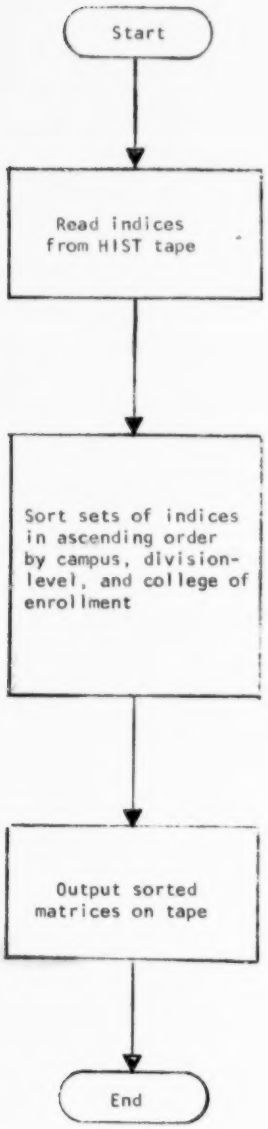
B: SORT-1 MODULE

The input is comprised of the two output tapes from INDEX-1. The first contains the indices from the Summer and Fall Terms and the second the indices from the Winter and Spring Terms of the academic year. The two tapes are concatenated.

The SORT-1 program produces as output on tape the indices sorted by campus, division-level, and college or category of enrollment.

FIGURE B-1

MACRO FLOW CHART FOR SORT-1


Start
Read indices from HIST tape
Sort sets of indices in ascending order by campus, division-level, and college of enrollment
Output sorted matrices on tape
End

```
//              'U6138,T=50,R=2500','TALLMAN B M',MSGLEVEL=(1,1)
//              TAPE=BMT17,OUT
//              TAPE=BMT18,IN
//              END OF TAPE CARDS
//SORT2 EXEC SORT
//SORT.SORTIN DD DSN=BMT17,UNIT=2400,VOL=SER=BMT17,DCB=(RECFM=FB,
//  LRECL=18,BLKSIZE=3600)
//SORT.SORTOUT DD DSN=&&OUT,DISP=(NEW,PASS),UNIT=SYSDA,
//  SPACE=(CYL,(5,5)),DCB=(RECFM=FB,LRECL=18,BLKSIZE=3600)
//SORT.INPUT DD *
 SORT FIELDS=(1,2,CH,A,3,2,CH,A,7,2,CH,A,5,2,CH,A)
//SEP EXEC FGCG
//SOURCE.INPUT DD *
      READ(10,159) JYR,JCAM,JCE,JSL,SCH
  159 FORMAT(4I2,F10.2)
      GOTO 70
   60 READ(10,159,END=75) JYR,JCAM,JCE,JSL,SCH
      IF(IY.NE.JYR) ENDFILE 11
   70 IY=JYR
      WRITE(11,159) JYR,JCAM,JCE,JSL,SCH
      GOTO 60
   75 STOP
      END
//DATA.FT10F001 DD DSN=&&OUT,DISP=(OLD,DELETE)
//DATA.FT11F001 DD DSN=YONE,UNIT=2400,VOL=SER=BMT18,LABEL=(1,SL),
//  DCB=(RECFM=FB,LRECL=18,BLKSIZE=3600)
//DATA.FT11F002 DD DSN=YTWO,UNIT=2400,LABEL=(2,SL),VOL=REF=*.FT11F001,
//  DCB=*.FT11F001
//DATA.FT11F003 DD DSN=YTHR,UNIT=2400,LABEL=(3,SL),VOL=REF=*.FT11F001,
//  DCB=*.FT11F001
//DATA.FT11F004 DD DSN=YFOU,UNIT=2400,LABEL=(4,SL),VOL=REF=*.FT11F001,
//  DCB=*.FT11F001
//DATA.FT11F005 DD DSN=YFIV,UNIT=2400,LABEL=(5,SL),VOL=REF=*.FT11F001,
//  DCB=*.FT11F001
//DATA.FT11F006 DD DSN=YSIX,UNIT=2400,LABEL=(6,SL),VOL=REF=*.FT11F001,
//  DCB=*.FT11F001
//DATA.FT11F007 DD DSN=YSEV,UNIT=2400,LABEL=(7,SL),VOL=REF=*.FT11F001,
//  DCB=*.FT11F001
//DATA.FT11F008 DD DSN=YEIG,UNIT=2400,LABEL=(8,SL),VOL=REF=*.FT11F001,
//  DCB=*.FT11F001
//DATA.FT11F009 DD DSN=YNIN,UNIT=2400,LABEL=(9,SL),VOL=REF=*.FT11F001,
//  DCB=*.FT11F001
//DATA.FT11F010 DD DSN=YTEN,UNIT=2400,LABEL=(10,SL),VOL=REF=*.FT11F001,
//  DCB=*.FT11F001
```

C: HIST-1 MODULE

In addition to the output from SORT-1, the user must supply the following card input for use of the HIST-1 module:

1: Header Card: One card defining the first line of output on each page,

i.e. ACTUAL SCH PRODUCTION: 1971-72.

2: Campus Name Cards: Same as INDEX-1.

3: Division-Level Cards: Same as INDEX-1.

4: Department and College Name Cards: Same as INDEX-1.

The HIST-1 program produces the general purpose and special purpose output in hard-copy form and the special purpose output for internal budget application and the ICLM coefficients on tape.

```
//DATA.INPUT DD *                                                                                                    06-13-73
                        HISTORICAL RUN 1971-1972
ALTOONA
ALLENTOWN
BEHREND
BERKS
BEAVER
CAPITOL
DELAWARE
DUBOIS
FAYETTE
HAZLETON
KING OF PRUSSIA
MONT ALTO
MCKEESPORT
NEW KENSINGTON
OGANTZ
SCHUYLKILL
SCRANTON
SHENANGO
UNIVERSITY PARK
WILKES BARRE
YORK
HERSHEY
GRADUATE
ASSOCIATE DEGREE
LOWER DIVISION
UPPER DIVISION
ADJUNCT
 1AGRIC ECO          204-08  01*     04.06.18.78.99
 2AGRIC EDUC         204-10  08       12.58
 3AGRIC ENG          204-12  09       14
 4ENTOMOLOGY         204-13  04       51.
 5AGRONOMY           204-15  01       24.
 6PLANT PATH         204-16  04       69.
 7ANIMAL SCI         204-17  01       28.30
 8DAIRY SCI          204-37  01       46
 9FORESTRY           204-53  01*      54.55.57.64.65.85.98.99
10FORETIC            204-66  01       63
11POLTRY SCI         204-77  01       72
12VET SCI            204-88  04       81
13INTER DEPT         204-00  01*      35.50.52.70
13AGRICULTURE
 1GEN EDUC           205-07  10       40
 2ARCH               205-11  02       10
 3ART HIST           205-14  10       25
 4LAND ARCH          205-33  02       50
 5MUSIC              205-38  10       60
 6ART                205-44  10       15.47
 7THEATRE            205-48  10       70
 8INTER DEPT         205-00  10       35
 HARTS & ARCH
 1ACCOUNTING         206-11  05       01
 2BUS LOG            206-15  05       12.15.47
 3FINANCE            206-19  05       40
 4INS & R E          206-24  05       43.45.56
 5MGT SCI            206-35  05       20.50.58
 6MARKETING          206-36  05       55
 7INTER-DEPT         206-00  05       10.30.35.68.70
 8BUS                        05       08
```

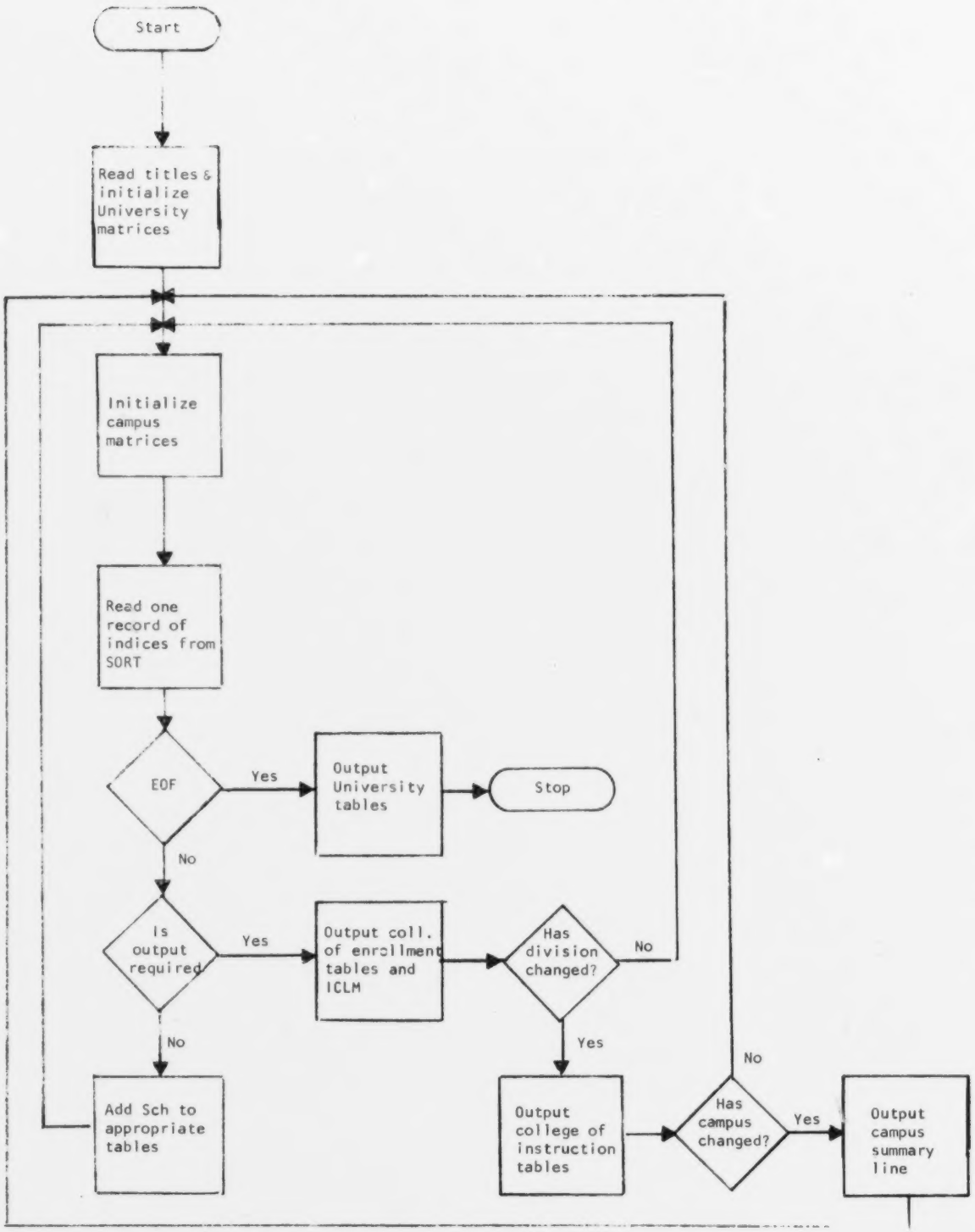
BUSINESS MG					
1AC CURR & F EXP	212-06320H		13,28,32,40,44,50,51,53,69,70,76	8540	06-13-73
2ART ED	212-08	08	01	8550	
3ED PSYC	212-10	08	22	8560	
4ED POLICY	212-12	08	12,14,20,36,64	8570	
5VOC ED	212-14	08	04,48,49,68,74,86	8580	
6HOME ECO ED	212-21	08	38	8590	
7MUSIC ED	212-24	08	52	8600	
8SPEC ED	212-36	08	10,18,80,82	8610	
9INTER-DEPT	212-00	08	16	8620	
9EDUCATION				8630	
1AERO ENG	215-14	09	05	8640	
2ARCH ENG	215-17	09	15	8650	
3AGRIC ENG		09	10	8660	
4CHEM ENG	215-19	09	11	8670	
5CIVIL ENG	215-21	09	20,22,70	8680	
6ELECT ENG	215-31	09	2521	8690	
7ACOUSTICS	215-33	09	31	8700	
8ENG MECH	215-37	09	45	8710	
9ENG SCI	215-38	09	50,51	8720	
10IND ENG	215-44	09	55,56	8730	
11MECH ENG	215-51	09	60,62	8740	
12GEN ENG	215-57	09	40,52,71,73,75,80,81,83,85,88,90	8750	
13NUCL ENG	215-58	09	65	8760	
14INTER-DEPT	215-00	09	35	8770	
14ENGINEERING				8780	
1HPE INSTRN	221-11	08*	01,03,10,30,10	8790	
1HEALTH & PE				8800	
1IND & FAM STDD	218-11	12	01,20,40,81,82	8810	
2RTOL HLTH	218-12	12*	02,30,60,89,90	8820	
3RTOL NURS	218-13	12	88	8830	
4COMM DEV	218-14	21	07,85	8840	
5MAN-ENVIR	218-15	13*	05,10,15,18,35,75,77,87,95,97	8850	
6INTER-DEPT	218-00	21	80	8860	
6HUMAN DEV				8870	
1GEN EDUC	221-01	15*	36,40,86	8880	
2ANTHRO	221-12	22	04	8890	
3CLASSICS	221-15	11	10,11,30,32,52	8900	
4ECONOMICS	221-18	22	16	8910	
5ENGLISH	221-24	15	14	8920	
6FRENCH	221-28	11	22	8930	
7GERMAN	221-31	11	28	8940	
8HISTORY	221-34	22	34	8950	
9JOURNALISM	221-41	05	01,46,87,91	8960	
10LABOR STDD	221-43	05	51	8970	
11LINGUISTICS	221-46	15	59	8980	
12PHILOSOPHY	221-51	15	60	8990	
13POL SC & PUB AD	221-54322		20,64,68,72,74	9000	
14PSYCHOLOGY	221-55	20	70	9010	
15RELIG STDD	221-56	15	76	9020	
16SLAVIC	221-59	11	57,62,78,80,82,84,98	9030	
17SOCIOLOGY	221-64	22	90,92	9040	
18SP IT & PUR	221-66	11	44,66,94	9050	
19SPEECH	221-67	15	89,96	9060	
20INTER-DEPT	221-05	49	02,06,09,12,13,24,26,54,56,58,61,88	9070	
21INTERDIS LA		49	03,23,25,63,71	9080	
21LIBERAL ARTS				9090	
1ANATOMY	217-12	04	05	9100	
2ANESH	217-14	12	07	9110	
3COMP MED	217-15	12	22,40	9120	

ANIMAL SCI	211-10	12	10	4130	
BIOL CHEM	211-22	12	15	4140	06-13-73
DRAM MED	211-25	12	30	4150	
MEDICINE	211-41	12*	20,60,62	4160	
BIOMETRICS	211-47	12	65	4170	
RADIOBIOLOGY	211-49	04	70	4180	
BIOPHYSICS	211-51	12	72	4190	
PHARMA	211-52	04	75	4200	
PSYCH	211-54	12	80	4210	
SURGICAL	211-62	12	82	4220	
SURGERY	211-61	12	90	4230	
MEDICINE				4240	
RADIOLOGY	224-12	22	10	4250	
PHYSIOLOGY	224-14	14	40	4260	
SCIENCES	224-19	19	04,12,20,28,32,60,64	4270	
ECO	224-24	14	44	4280	
ENG	224-25	04	45,48,50,72,76,78,80,84,92	4290	
SCI & CONST	224-3620004*		01,08,34,36,50,52,88,94,98	4300	
OTHER-DEPT	224-00	14	06	4310	
ENG-M & M S				4320	
ENG EDUC	228-01	04*	12,60,70,90	4330	
GEOGRAPHY	228-04	14	01	4340	
CHEM	228-12	04	10,12	4350	
GEOLOGY	228-14	04	14,15,90	4360	
ECONOMICS	228-21	14	20	4370	
POLSCI	228-22	01	25,91	4380	
RADIO	228-44	01	03,30,32	4390	
MUSIC	228-46	04*	40,55	4400	
PHYSICS	228-54	14	55	4410	
STATISTICS	228-74	11	29,92	4420	
SCIENCE				4430	
ENV POL CONT	231-20	44	07	4440	
REG PL & ADM	231-22	44*	05,10	4450	
PHY GEN SP ED	232-01	04*	10,12,15,18	4460	
ASIAN	231-09	44	20,90	4470	
AT TEX-COLLEGE				4480	
DOC	281-XX	10	01,10,20	4490	
DOC				4500	
DOC				4510	
DOC				4520	
MUS SU SC & ED	260-10	22*		4530	
ENG & TECH	260-20	04*		4540	
BUS & ADM	260-30	05*		4550	
MATH	260-40	07*		4560	
AGRICULTURE				4570	
AGRICULT				4580	
-UNDERGRAD				4590	
SCI TEACHING EDUC				4600	
-UNDERGRAD				4610	

/* THIS IS A SLASH ASTERISK CARD

FIGURE C-1

MACRO FLOW CHART FOR HIST-1



```
//                TAPE=RM15,IN1                                                 0010                    06-13-73
//                TAPE=RM123,IN
//                TAPE=RM124,IN
//                TAPE=RM125,IN
//                END OF TAPE CARDS                                             0040
// EXEC PGM=WILOG
//STEPLIB DD DSN=SYS1.PSUICES.MODULIN,UNIT=2314,VOL=SER=MUDCEN,
// DISP=SHR
//FT06F001 DD SYSOUT=A
//FT07F001 DD SYSOUT=B
//FT05F001 DD *
 HISTORICAL
  CREDITS
  1971-72
/*          THIS IS A SLASH ASTERISK CARD
//HIST EXEC FGCG                                                              0050
//SOURCE.INPUT DD *
C     FIXED 11/20/72 -- FIX * VERSION 2.12 *                                  0002
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC 0004
C                                                                             0006
C                                                                             0008
C                                                                             0010
C         THIS PART OF THE PROJECT IS WRITTEN TO USE THE INDICES              0012
C         PRODUCED BY THE INITIAL PART AND SORTED ON VARIOUS FIELDS BY        0014
C         THE SECOND PROGRAM.  FIRST OF ALL, TABLES ARE BUILT WHICH ARE       0016
C         USED IN THE OUTPUT.  THE VARIOUS MATRICES WHICH ARE BUILT           0018
C         ARE THEN INITIALIZED TO ZERO.  THIS MUST BE DONE BY THE             0020
C         PROGRAM SINCE IT MUST BE DONE SEVERAL TIMES.  A SET OF INDICES      0022
C         ARE CALLED IN AND CHECKED TO BE SURE THAT NO PRINTING NEED          0024
C         TO BE DONE.  THE CREDITS ARE ADDED TO THE APPROPRIATE TABLES        0026
C         AND SUMS.  COPIES ARE KEPT OF THE CAMPUS, STUDENT LEVEL, AND        0028
C         COLLEGE OF ENROLLMENT.  NOW THE NEXT SET OF INDICES IS CALLED       0030
C                                                                             0032
C         TWO TYPES OF TABLES ARE PRINTED.  WITH EACH COLLEGE OF              0034
C         ENROLLMENT, WE OUTPUT A TABLE WHICH SHOWS THE CREDITS TAKEN         0036
C         BY STUDENTS AT THAT PARTICULAR COLLEGE OF ENROLLMENT IN THE         0038
C         VARIOUS COLLEGES TAUGHT.  THEN AT THE FIVE DIFFERENT STUDENT        0040
C         LEVELS, WE PRINT A SERIES OF THIRTEEN TABLES, ONE FOR EACH          0042
C         COLLEGE TAUGHT SHOWING THE NUMBER OF CREDITS TAKEN IN THE           0044
C         VARIOUS DEPARTMENTS.  THIS IS THE NUMBER OF CREDITS TAKEN           0046
C         BY ALL STUDENTS AT THIS PARTICULAR CAMPUS AND STUDENT LEVEL.        0048
C                                                                             0050
C         IN PRINTING THE TABLES, AN ARRAY OF TOTALS IS USED TO ELIMINATE     0052
C         THE ZERO TABLES AND THE ZERO ROWS.                                  0054
C         A LINE COUNT IS USED TO PUT AS MUCH AS POSSIBLE ON EACH PAGE.       0056
C                                                                             0058
C         SOME OF THE VARIABLES AND ARRAYS USED IN THE PROGRAM ARE:           0060
C                                                                             0062
C              INDEX===> THE SET OF INDICES PASSED FROM THE FIRST MODULE      0064
C                        THIS SET COMPLETELY SPECIFIES THE RECORD.            0066
C                                                                             0068
C           INDEX NUMBER          INFORMATION IN INDEX                        0070
C              INDEX(1) ===>         CAMPUS INDEX                           0072
C              INDEX(2) ===>         NUMBER OF COLLEGE OF ENROLLMENT        0074
C              INDEX(3) ===>         COURSE LEVEL INDICATOR                 0076
C              INDEX(4) ===>         INDEX TO COLLEGE TAKEN                 0078
C              INDEX(5) ===>         INDEX TO DEPARTMENT TAKEN              0080
C              INDEX(6) ===>         NUMBER OF CREDITS TAKEN                0082
C              INDEX(7) ===>         STUDENT LEVEL INDICATOR                0084
```

```
C
C
C          CBC ===> AN INTEGER TABLE USED TO KEEP COUNT OF THE
C                   NUMBER OF CREDITS TAKEN BY A PARTICULAR COLLEGE
C                   OF ENROLLMENT IN EACH OF THE THIRTEEN COLLEGES
C                   TAUGHT.
C
C          ACOL ===>A THREE DIMENSIONAL ARRAY TO KEEP CREDITS
C                   TAKEN IN PARTICULAR DEPARTMENTS.  THERE IS
C                   A MATRIX FOR EACH COLLEGE TAUGHT.
C
C          CAP====>  THIS MATRIX PERFORMS THE SAME FUNCTION AS THE
C                   ARRAY ACOL, BUT THIS IS A SPECIAL CASE FOR
C                   CAPITOL CAMPUS.
C
C          SCOL===> AN ARRAY SIMILAR TO ACOL BUT THESE MATRICES
C                   HOLD CREDITS TAKEN BY A PARTICULAR COLLEGE OF
C                   ENROLLMENT WHEREAS ACOL HAS ALL CREDITS FOR A
C                   PARTICULAR STUDENT LEVEL.  THESE MATRICES THEN
C                   FORM THE COEFFICIENT MATRICES USED IN ITERATION.
C                   THESE COEFFICIENTS ARE THEN PUT ON TAPE.  A
C                   SEPARATE FILE FOR EACH CAMPUS.
C
C          SCAP===> THIS IS THE COEFFICIENT MATRIX FOR CAPITOL
C
C          TAB===>  THIS ARRAY IS USED TO INDICATE WHICH OF THE
C                   MATRICES IS ZERO AND NEED NOT BE PRINTED.
C                   THE CORRESPONDING COLLEGE.
C
C          TOTD,TOTA,TOAC===> THESE ARRAYS ARE USED TO HOLD TOTALS
C                             OF VARIOUS ARRAYS.  THIS INFORMATION
C                             IS USED TO ELIMINATE UNNECESSARY
C                             PRINTING.
C
C
C          IND ===> A SET OF FIVE NUMBERS WHICH ARE USED TO IDENTIFY
C                   THE TABLES OF COEFFICIENTS WHICH FOLLOW IT.
C                   THEY ARE:
C
C                        INDEX NUMBER    INFORMATION STORED
C                           IND(1)          CAMPUS INDEX
C                           IND(2)          STUDENT LEVEL
C                           IND(3)          COLLEGE OF ENROLLMENT
C                           IND(4)          COLLEGE TAKEN
C                           IND(5)          NEXT COLLEGE TAKEN
C
C          THE FOLLOWING THREE LISTS ARE USED FOR OUTPUT ONLY AND
C          ARE NOT MANDATORY FOR THE PROPER FUNCTIONING OF THE
C          PROGRAM
C
C          DEP===>THIS HOLDS A LIST OF ALL COLLEGES AT THE UNIVER-
C                 SITY AND THE RESPECTIVE LISTS OF DEPARTMENTS
C                 FOR EACH COLLEGE
C
C          CAMP===>LIST OF ALL CAMPUS NAMES
C
C          SLEV===>THIS LIST IS INITIALIZED TO HOLD THE FIVE
C                  STUDENT LEVELS
C
C     THERE ARE TWO SETS OF CODES USED IN THE PROGRAM.  THE FIRST
```

```
C        IS THE STUDENT LEVEL CODE WHICH HAS FIVE DIFFERENT VALUES.      0212                    06-13-73
C        THEY ARE:                                                       0214
C                                                                        0216
C             STUDENT LEVEL          TYPE OF STUDENT                    0218
C                1    ===>            GRADUATE                         0220
C                2    ===>            ASSOCIATE DEGREE                 0222
C                3    ===>            LOWER DIVISION                   0224
C                4    ===>            UPPER DIVISION                   0226
C                5    ===>            ADDUNCT                          0228
C                                                                        0230
C        THE SECOND CODE IS FOR COURSE LEVELS.  AGAIN THERE ARE FIVE     0232
C        CLASSIFICATIONS WHICH ARE:                                      0234
C                                                                        0236
C             COURSE LEVEL           COURSE NUMBER                      0238
C                1    ===>            0 - 399                          0240
C                2    ===>            400 - 499                        0242
C                3    ===>            500 - 599                        0244
C                4    ===>            600 - 699                        0246
C                5    ===>            800 - 899                        0248
C                                                                        0250
C                                                                        0252
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC 0254
      REAL*8 HEADER(10)                                                  0256
      LOGICAL*4 SWITCH                                                   0258
      INTEGER*4 IDEPT(5,15,22,5)
      INTEGER*4 CDEPT(5,22,8)                                            0260
      INTEGER*4 ICRC(5,16,16,6)                                          0262
      INTEGER*4 IAH(6),IC(16)                                            0264
      INTEGER*4 CAP(4,5),INDEX(7),IAB(13),CULL(16),CRC(13,5),IDD(13,6),  0266
     1IOTA(19),NZPIR(14),NDEP(15),ACOL(5,21,13),IDAC(13,21),IND(5)       0268
      INTEGER*4 MEGIS(140)                                               0270
      REAL*4 SCAP(4,5),SCOL(5,21,13)                                     0272
      REAL*4 GTOTAL(6)                                                   0274
      REAL*4 SUBCAT(30,2)                                                0276
      LOGICAL*1 CAMP(22,16),SLEV(5,16),DEP(141,26),MDEP(26)
      COMMON ACOL,IDEPT,CDEPT,SUBCAT,IDD,CULL,MEGIS,CAMP,DEP             0278
      DATA NDEP/13,8,8,9,14,1,6,21,14,7,10,4,1,0,4/                      0280
  100 FORMAT (16A1)                                                      0282
  102 FORMAT ('1',///,11X,'CAMPUS=',23X,16A1)                            0284
  104 FORMAT ('0',10X,'STUDENT LEVEL=',16X,16A1)                         0286
  106 FORMAT ('0',6(/),2(10X,'CREDITS TAKEN IN COLLEGE OF ',16A1,8X))    0288
  108 FORMAT ('0',7X,'DEPT',22X,'COURSE LEVEL',28X,'DEPT',22X,'COURSE LE 0290
     1VEL'//)                                                            0292
  110 FORMAT (' ',2X,16A1,2X,5(I6,3X),4X,16A1,2X,5(I6,3X))               0294
  112 FORMAT (' ',2X,16A1,2X,5(I6,3X))                                   0296
  114 FORMAT ('0',/,/1X,'CREDITS TAKEN IN COLLEGE OF ROTC')              0298
  116 FORMAT (' ',69X,16A1,2X,5(I6,3X))                                  0300
  118 FORMAT (' ',20X,' 0 -399  400-499  500-599  600-699  800-899',26X, 0302
     1' 0 -399  400-499  500-599  600-699  800-899')                     0304
  120 FORMAT ('0',5X,'TOTALS',9X,5(I6,3X),7X,'TOTALS',9X,5(I6,3X))       0306
  122 FORMAT ('0',35X,'CREDITS TAKEN BY STUDENTS ENROLLED IN COLLEGE OF' 0308
     1,1X,16A1)                                                          0310
  124 FORMAT ('0',20X,16A1,5X,5(I6,4X),'I',I6)                           0312
  126 FORMAT ('2',20X,'CAMPUS=',12X,16A1,/,21X,'STUDENT LEVEL=',5X,16A1) 0314
  128 FORMAT (' ',40X,' 0 -399   400-499   500-599   600-699   800-899   0316
     1  I TOTALS')                                                       0318
  130 FORMAT (' ',5X,'GRAND TOTAL ',3X,I6,46X,'GRAND TOTAL',4X,I6)       0320
  132 FORMAT ('+',20X,46('_'),20X,46('_'))                               0322
  134 FORMAT (' ',7(/),10X,'CREDITS TAKEN IN COLLEGE OF CAPITOL',//,7X,' 0324
     1DEPT',22X,'COURSE LEVEL',///,20X,' 0 -399  400-499  500-599  600-6 0326
```

```
  136 FORMAT ('0',5(/),'CREDITS TAKEN IN COLLEGE OF CAPITOL',///)
  138 FORMAT ('0',5X,'TOTALS',9X,5(I6,3X),/,6X,'GRAND TOTAL',4X,I6)
  140 FORMAT ('0',6(/),10X,'CREDITS TAKEN IN COLLEGE OF ',16A1,///,7X,'DE
     1PT',22X,'COURSE LEVEL',//,20X,' 0 -399  400-499  500-599  600-699
     2 800-899')
  142 FORMAT ('+',40X,60('_'),//,25X,'TOTALS',11X,5(I6,4X),'I',I6)
  144 FORMAT ('+',20X,46('_'),/,6X,'TOTALS',9X,5(I6,3X),/,6X,'GRAND TOTA
     1L',4X,I6)
  145 FORMAT (I2,24A1,I2)
  146 FORMAT ('0',///,15X,'CAMPUS',35X,'STUDENT LEVEL',/,31X,'GRADUATE',
     17X,'ASSOCIATE',6X,'0 - 399',7X,'400 - 499',8X,'ADJUNCT',14X,'TOTAL
     2')
  150 FORMAT ('0',7X,'PSE TOTALS',6X,5(9X,I6),13X,I8)
  152 FORMAT (' ',5(F8.3,4X),10X,5(F8.3,4X))
  154 FORMAT (' ',10X,5(F8.3,4X))
  156 FORMAT (' ',5(F8.3,4X))
  158 FORMAT ('+',20X,46('_'))
  160 FORMAT ('0',20X,16A1,5X,5(I6,4X),////)
  162 FORMAT ('1')
  164 FORMAT ('2')
  166 FORMAT ('3',15X,'THE TOTAL NUMBER OF CREDITS PROCESSED IN THIS RUN
     1= ',I9)
  168 FORMAT ('2',20X,'UNIVERSITY TOTALS=',14X,16A1)
  170 FORMAT ('0REGIS CODE',120,'GRAD CREDITS',140,'UNDERGRAD CREDITS',1
     160,'TOTAL CREDITS',180,'  GRAD FTE',1100,'UNDERGRAD FTE',1120,'TO
     2TAL FTE')
  172 FORMAT (' ',I110)
  174 FORMAT ('0',I5,I20,F10.2,I40,F10.2,I60,F10.2,I80,F10.2,I100,F10.2,
     1I120,F10.2)
  176 FORMAT (//,' UNIVERSITY TOTALS:',I20,F10.2,I40,F10.2,I60,F10.2,I80
     1,F10.2,I100,F10.2,I120,F10.2)
  178 FORMAT ('1',20X,10A8)
C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
C         BUILDING TABLES AND INITIALIZATION OF MATRICES TO ZERO
C         WE FIRST OF ALL READ IN THE CAMPUS NAMES AND STUDENT LEVELS.
C         THEN THE VARIOUS DEPARTMENTS UNDER EACH COLLEGE ARE PUT INTO
C         AN ARRAY FOR PRINTING
C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
      READ (5,180) HEADER
  180 FORMAT (10A8)
COMMENT: INITIALIZE BEGIS SUBCATAGORIES.
      DO 182  I=1,30
      DO 182  J=1,2
  182 SUBCAT(I,J)=0.0
COMMENT: INITIALIZE UNIVERSITY GRAND TOTALS BY COLLEGE OF ENROLLMENT
      DO 184  I=1,5
      DO 184  J=1,16
      DO 184  K=1,16
      DO 184  L=1,6
  184 UGRC(I,J,K,L)=0
COMMENT: INITIALIZE UNIVERSITY TOTALS OF DEPARTMENTAL CREDIT LOADS.
      DO 186  I=1,5
      DO 186  J=1,15
      DO 186  K=1,22
      DO 186  L=1,5
  186 UDEPT(I,J,K,L)=0
```

```
      DO 187 J=1,15
      DO 187 K=1,22
      DO 187 L=1,8
  187 COEFF(J,K,L)=0
C     COMMENT: SET SWITCH TO TRUE IF WANT TO PREPARE INPUT FOR ITEM PROGRAM.
      SWITCH=.TRUE.
      SWITCH=.FALSE.
      NCT=0
      WRITE (9,177) HEADER
      WRITE (9,148)
C
C     COMMENT: READ CAMPUS NAMES.
      DO 188  I=1,22
C     COMMENT: READ STUDENT LEVEL NAMES.
  188 READ (5,100) (CAMP(I,J),J=1,10)
      DO 190  I=1,5
      ICT(I)=0
      IADJ(I)=0
  190 READ (5,100) (SLEVL(I,J),J=1,10)
      IADJ(6)=0
      ICT(6)=0
      K=1
      ICOL=1
      IPT=2
C     COMMENT: READ DEPARTMENT NAMES AND THEIR RESPECTIVE MEGIS CODES.
  192 I=0
      GO TO 196
  194 I=J
  196 IF (NCT.EQ.140) GO TO 206
      READ (5,146,END=206) J,(NUMB(L),L=1,24),ICODE
      NCT=NCT+1
      DO 198  L=1,24
      IF (I.EQ.J) GO TO 202
  198 DEP(IPT,L)=NUMB(L)
      MEGIS(IPT)=ICODE
      WRITE (6,200) NCT,(DEP(IPT,L),L=1,24),MEGIS(IPT)
  200 FORMAT (' ',I3,5X,24A1,5X,'MEGIS CODE =',I3)
      IPT=IPT+1
      GO TO 194
  202 DO 204  L=1,24
  204 DEP(ICOL,L)=NUMB(L)
      WRITE (6,200) NCT,(DEP(ICOL,L),L=1,24),ICODE
      COLL(M)=ICOL
      ICOL=IPT
      IPT=IPT+1
      M=M+1
      GO TO 192
C
CCCC
```

```
C                  PROCESSED IN A RUN.                                          0562
C                                                                               0564
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC 0566
C                                                                               0568
  206 IS1=0                                                                     0570
      IS2=0                                                                     0572
      IY1=0                                                                     0574
      WRITE (6,1(8) HEADER                                                      0576
      CALL GET (10,INDEX,28,KEY)                                                0578
      ISL=INDEX(7)                                                              0580
      ICE=INDEX(2)                                                              0582
      IND(2)=INDEX(7)                                                           0584
C                                                                               0586
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC 0588
C                                                                               0590
C         THIS INITIALIZATION IS DONE ONLY WHEN WE START TO PROCESS A           0592
C         NEW CAMPUS OR STUDENT LEVEL.                                          0594
C                                                                               0596
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC 0598
C                                                                               0600
  208 DO 210  I=1,13                                                            0602
      DO 210  J=1,21                                                            0604
      TOAC(I,J)=0                                                               0606
      DO 210  K=1,5                                                             0608
  210 ACOL(K,J,I)=0                                                             0610
      DO 212  K=1,5                                                             0612
      DO 212  J=1,4                                                             0614
  212 CAP(J,K)=0                                                                0616
      DO 214  K=1,13                                                            0618
      DO 214  L=1,6                                                             0620
  214 TOTD(K,L)=0                                                               0622
C                                                                               0624
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC 0626
C                                                                               0628
C         THIS INITIALIZATION IS DONE EACH TIME A NEW COLLEGE OR                0630
C         ENROLLMENT IS ENCOUNTERED.                                            0632
C                                                                               0634
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC 0636
C                                                                               0638
  216 DO 218  J=1,13                                                            0640
      DO 218  K=1,5                                                             0642
  218 CHCL(J,K)=0                                                               0644
      DO 220  J=1,19                                                            0646
  220 TOTA(J)=0                                                                 0648
      DO 222  I=1,13                                                            0650
      TAB(I)=0                                                                  0652
      DO 222  J=1,21                                                            0654
      DO 222  K=1,5                                                             0656
  222 SCOL(K,J,I)=0.0                                                           0658
      DO 224  J=1,4                                                             0660
      DO 224  K=1,5                                                             0662
  224 SCAP(J,K)=0.0                                                             0664
      GO TO 230                                                                 0666
C                                                                               0668
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC 0670
C                                                                               0672
C         BRING IN A SET OF INDICES FROM TAPE AND CHECK FOR PRINTING.           0674
C         THIS WILL BE NECESSARY IF THE INDICES REPRESENT A NEW CAMPUS,         0676
C         STUDENT LEVEL, OR COLLEGE OF ENROLLMENT.  OTHERWISE, PROCESS IN       0678
```

```
C         INDICES.  THIS IS DONE BY ADDING THE NUMBER OF CREDITS REPRE-
C         SENTED TO VARIOUS COUNTERS, TABLES, AND TOTALS.  THE
C         APPROPRIATE ELEMENT OF THE ARRAY TAB IS SET TO INDICATE THAT
C         THE CORRESPONDING ARRAY IS NON-ZERO.
C
C         IF THE CAMPUS IS CAPITOL, WE ADD THE CREDITS TO THE SPECIAL
C         ARRAYS DESCRIBED EARLIER.  IN BOTH CASES, WE KEEP A COPY OF
C         CAMPUS, STUDENT LEVEL, AND COLLEGE OF ENROLLMENT TO DETERMINE
C         WHEN PRINTING IS NECESSARY.
C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
  220 CALL GET (10,INDEX,20,KEY)
      IF (KEY.EQ.1) GO TO 230
COMMENT: CHECK FOR INVALID SUBSCRIPT ZERO.
      DO 225  I=1,7
      IF (INDEX(I).NE.0) GO TO 225
      WRITE (15,172) INDEX
      GO TO 220
  225 CONTINUE
COMMENT: CHECK FOR STUDENT LEVEL, CAMPUS, OR COLLEGE OF ENROLLMENT CHANG
      IF ((ISL.NE.INDEX(7)).OR.(ICA.NE.INDEX(1)).OR.(ICE.NE.INDEX(2))) G
     1O TO 230
COMMENT: CALCULATE TOTAL CREDITS PROCESSED.
  230 IYI=IYI+INDEX(6)
COMMENT: CHECK FOR CAPITOL PROGRAM.
      IF (INDEX(4).EQ.15) GO TO 232
      ACOL(INDEX(3),INDEX(5),INDEX(4))=ACOL(INDEX(3),INDEX(5),INDEX(4))+
     1INDEX(6)
      SCOL(INDEX(3),INDEX(5),INDEX(4))=SCOL(INDEX(3),INDEX(5),INDEX(4))+
     1INDEX(6)
      TAB(INDEX(4))=1
COMMENT: SAVE CURRENT RECORD'S INDICIES TO COMPARE NEXT RECORD.
      ISL=INDEX(7)
      ICA=INDEX(1)
      ICE=INDEX(2)
      CRC(INDEX(4),INDEX(3))=CRC(INDEX(4),INDEX(3))+INDEX(6)
      TOTD(INDEX(4),INDEX(3))=TOTD(INDEX(4),INDEX(3))+INDEX(6)
      TOTD(INDEX(4),6)=TOTD(INDEX(4),6)+INDEX(6)
      TOAC(INDEX(4),INDEX(5))=TOAC(INDEX(4),INDEX(5))+INDEX(6)
      TOTA(INDEX(4))=TOTA(INDEX(4))+INDEX(6)
      TOTA(13+INDEX(3))=TOTA(13+INDEX(3))+INDEX(6)
      TOTA(19)=TOTA(19)+INDEX(6)
COMMENT: ADD TO TOTAL UNIVERSITY CREDITS BY STUDENT LEVEL TABLE.
      IAUT(ISL)=IAUT(ISL)+INDEX(6)
      IAUT(6)=IAUT(6)+INDEX(6)
      ICT(ISL)=ICT(ISL)+INDEX(6)
      ICT(6)=ICT(6)+INDEX(6)
      GO TO 220
COMMENT: THIS IS THE SPECIAL CAPITOL CAMPUS SECTION.
  232 CAP(INDEX(5),INDEX(3))=CAP(INDEX(5),INDEX(3))+INDEX(6)
      SCAP(INDEX(5),INDEX(3))=SCAP(INDEX(5),INDEX(3))+INDEX(6)
      TOTA(INDEX(3))=TOTA(INDEX(3))+INDEX(6)
      TOTA(6)=TOTA(6)+INDEX(6)
      TOTD(1,INDEX(3))=TOTD(1,INDEX(3))+INDEX(6)
      TOTD(1,6)=TOTD(1,6)+INDEX(6)
      TOAC(1,INDEX(5))=TOAC(1,INDEX(5))+INDEX(6)
COMMENT: SAVE CURRENT RECORD'S INDICIES TO COMPARE NEXT RECORD.
      ISL=INDEX(7)
      ICA=INDEX(1)
```

```
      ICE=INDEX(2)                                                          0800
COMMENT: ADD TO TOTAL UNIVERSITY CREDITS BY STUDENT LEVEL TABLE.            0802          06-13-73
      IAUT(ISL)=IAUT(ISL)+INDEX(6)                                          0804
      IAUT(6)=IAUT(6)+INDEX(6)                                              0806
      ICT(ISL)=ICT(ISL)+INDEX(6)                                            0808
      ICT(6)=ICT(6)+INDEX(6)                                                0810
      GO TO 226                                                             0812
C                                                                           0814
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC 0816
C                                                                           0818
C         THIS SECTION DEALS WITH THE OUTPUT OF INFORMATION TO TAPE         0820
C         AND PRINTER.                                                      0822
C                                                                           0824
C         FOR EACH COLLEGE OF ENROLLMENT, PRINT THE CORRESPONDING           0826
C         TABLE WHICH HAS ALL THE CREDITS TAKEN BY STUDENTS IN THIS         0828
C         COLLEGE OF ENROLLMENT.  THE CREDITS ARE GIVEN BY COURSE LEVEL     0830
C         AND BY THE COLLEGE IN WHICH THE COURSE WAS TAKEN.                 0832
C         A SPECIAL CASE IS CONSIDERED FOR CAPITOL CAMPUS.                  0834
C                                                                           0836
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC 0838
C                                                                           0840
COMMENT: OUTPUT SECTION FOR ALL CAMPUSES EXCEPT CAPITOL.                    0842
  234 ISL=1                                                                 0844
  236 WRITE (6,126) (CAMP(ICA,L),L=1,16),(STLEV(ISL,L),L=1,16)              0846
      WRITE (6,122) (DEP(COLL(ICE),L),L=1,16)                               0848
      WRITE (6,128)                                                         0850
COMMENT: CHECK FOR CAPITOL PROGRAM.                                         0852
      IF (ICA.NE.6) GO TO 242                                               0854
COMMENT: OUTPUT SECTION FOR CAPITOL CAMPUS.                                 0856
      WRITE (6,160) (DEP(COLL(15),L),L=1,16),(TOTA(J),J=1,6)                0858
      DO 238  J=1,4                                                         0860
      DO 238  K=1,5                                                         0862
  238 SCAP(J,K)=SCAP(J,K)/FLOAT(TOTA(6))                                    0864
COMMENT: ADD CAMPUS TOTALS BY COLLEGE OF ENROLLMENT TO UNIVERSITY           0866
C              GRAND TOTALS.                                                0868
      DO 240  J=1,6                                                         0870
      UCRC(ISL,ICE,15,J)=TOTA(J)                                            0872
  240 UCRC(ISL,ICE,16,J)=UCRC(ISL,ICE,16,J)+TOTA(J)                         0874
      IND(1)=ICA                                                            0876
      IND(2)=ISL                                                            0878
      IND(3)=ICE                                                            0880
      IND(4)=15                                                             0882
      IND(5)=999                                                            0884
      IF (SWITCH) WRITE (11) (IND(L),L=1,5)                                 0886
      IF (SWITCH) WRITE (11) ((SCAP(K,L),L=1,5),K=1,4)                      0888
      GO TO 258                                                             0890
COMMENT: OUTPUT SECTION FOR ALL CAMPUSES EXCEPT CAPITOL.                    0892
  242 DO 244  J=1,13                                                        0894
      IF (TOTA(J).EQ.0) GO TO 244                                           0896
      WRITE (6,124) (DEP(COLL(J),L),L=1,16),(CRC(J,K),K=1,5),TOTA(J)        0898
  244 CONTINUE                                                              0900
      WRITE (6,142) (TOTA(13+J),J=1,6)                                      0902
C                                                                           0904
COMMENT: ADD CAMPUS TOTALS BY COLLEGE OF ENROLLMENT TO UNIVERSITY           0906
C              GRAND TOTALS.                                                0908
C                                                                           0910
      DO 248  J=1,13                                                        0912
      DO 246  K=1,5                                                         0914
  246 UCRC(ISL,ICE,J,K)=UCRC(ISL,ICE,J,K)+CRC(J,K)                          0916
  248 UCRC(ISL,ICE,J,6)=UCRC(ISL,ICE,J,6)+TOTA(J)                           0918
```

```
C
COMMENT: ADD CAMPUS GRAND TOTALS BY COLLEGE OF ENROLLMENT TO                    0922        06-13-73
C              UNIVERSITY GRAND TOTALS.                                         0924
C                                                                               0926
      DO 250  J=1,6                                                             0928
  250 UCRC(ISL,ICF,16,J)=UCRC(ISL,ICF,16,J)+TOTA(J+13)                          0930
C                                                                               0932
C                                                                               0934
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC  0936
C                                                                               0938
C         AT THIS POINT, WE PUT A SERIES OF THIRTEEN TABLES FOR THIS            0940
C         COLLEGE OF ENROLLMENT ON TAPE TO BE USED IN THE ITERATION             0942
C         PART OF THE PROJECT.  THESE ARE THE COEFFICIENT MATRICES              0944
C         DETERMINED BY DIVIDING THE MATRIX OF CREDITS BY THE TOTAL             0946
C         NUMBER OF CREDITS IN THIS COLLEGE OF ENROLLMENT.  IF A MATRIX         0948
C         OF COEFFICIENTS IS ZERO, IT IS NOT PUT ON TAPE.                       0950
C                                                                               0952
C         TO IDENTIFY EACH TABLE, A SET OF FIVE INDICES, EXPLAINED              0954
C         ELSEWHERE, IS ALSO PUT-OUT TO TAPE.                                   0956
C                                                                               0958
C         WE ALSO HAVE THE POSSIBILITY OF PRINTING THE MATRICES OF              0960
C         COEFFICIENTS IF SWITCH 152 IS ON.                                     0962
C                                                                               0964
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC  0966
C                                                                               0968
      FTOT=FLOAT(TOTA(19))                                                      0970
      DO 252  I=1,13                                                            0972
      DO 252  J=1,21                                                            0974
  252 SCOL(K,J,I)=SCOL(K,J,I)/FTOT                                              0976
      DO 252  K=1,5                                                             0980
      L1=1                                                                      0982
      DO 254  J=1,13                                                            0984
      IF (TAB(J).EQ.0) GO TO 254                                                0986
      NZPTR(L1)=J                                                               0988
      L1=L1+1                                                                   0990
  254 CONTINUE                                                                  0992
      NZPTR(L1)=999                                                             0994
      IND(1)=ICA                                                                0996
      IND(2)=ISL                                                                0998
      IND(3)=ICF                                                                1000
      L1=1                                                                      1002
  256 IF (NZPTR(L1).EQ.999) GO TO 258                                           1004
      IND(4)=NZPTR(L1)                                                          1006
      IND(5)=NZPTR(L1+1)                                                        1008
      NU=NDEP(NZPTR(L1))                                                        1010
      IF (SWITCH) WRITE (11) (IND(L),L=1,5)                                     1012
      IF (SWITCH) WRITE (11) ((SCOL(K,L,NZPTR(L1)),K=1,5),L=1,NU)               1014
      L1=L1+1                                                                   1016
      GO TO 256                                                                 1018
  258 IF (ISZ.EQ.0) GO TO 274                                                   1020
      I1=1                                                                      1022
      WRITE (6,122) (DEP(COLL(ICF),L),L=1,16)                                   1024
COMMENT: CHECK FOR CAPITOL PROGRAM.                                             1026
      IF (ICA.NE.6) GO TO 262                                                   1028
COMMENT: OUTPUT SECTION FOR CAPITOL CAMPUS.                                     1030
      WRITE (6,136)                                                             1032
      DO 260  J=1,4                                                             1034
  260 WRITE (6,156) (SCAP(J,K),K=1,5)                                           1036
      GO TO 274                                                                 1038
  262 WRITE (6,106) (DEP(COLL(I1),L),L=1,16),(DEP(COLL(I1+1),L),L=1,16)
```

```
      II=II+2
      MI1=MINO(NDEP(I1-2),NDEP(I1-1))
      DO 264  J=1,MI1
  264 WRITE (6,152) (SCOL(K,J,I1-2),K=1,5),(SCOL(K,J,I1-1),K=1,5)
      MI1=MI1+1
      IF ((I1.NE.13).AND.(NDEP(I1-2).EQ.NDEP(I1-1))) GO TO 262
      IF (NDEP(I1-2).EQ.NDEP(I1-1)) GO TO 262
      IF (NDEP(I1-2).GT.NDEP(I1-1)) GO TO 268
      MA1=NDEP(I1-1)
      DO 266  J=MI1,MA1
  266 WRITE (6,154) (SCOL(K,J,I1-1),K=1,5)
      IF (I1.EQ.13) GO TO 272
      GO TO 262
  268 MA1=NDEP(I1-2)
      DO 270  J=MI1,MA1
  270 WRITE (6,156) (SCOL(K,J,I1-2),K=1,5)
      IF (I1.NE.13) GO TO 262
  272 WRITE (6,114)
      WRITE (6,154) (SCOL(K,1,13),K=1,5)
  274 IF ((ISL.EQ.INDEX(I)).AND.(ICA.EQ.INDEX(I)).AND.(ISI.EQ.0)) GO TO
     1216
C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
C         CAMPUS OR STUDENT LEVEL CHANGES OR THE END OF THE INPUT FILE
C         IS REACHED. WE OUTPUT THIS INFORMATION.
C         HERE WE PRINT AGAIN A SERIES OF THIRTEEN TABLES BUT THESE
C         ARE FOR ALL COLLEGES OF ENROLLMENT AT THIS PARTICULAR STUDENT
C         LEVEL.
C
C         WE FIRST OF ALL BUILD A LIST OF POINTERS INDICATING WHICH
C         TABLES ARE NON-ZERO.  A MARKER IS USED TO DESIGNATE THE END OF
C         THE LIST.
C
C         CAPITOL CAMPUS IS OUTPUTED AS A SPECIAL CASE.
C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
      I=1
      L1=1
      DO 276  J=1,13
      IF (IDID(J,6).EQ.0) GO TO 276
      NZPTR(L1)=J
      L1=L1+1
  276 CONTINUE
      NZPTR(L1)=999
      WRITE (6,102) (CAMP(ICA,L),L=1,16)
      WRITE (6,104) (STLEV(ISL,L),L=1,16)
      LNCT=5
      IF (ICA.NE.6) GO TO 286
      WRITE (6,134)
      DO 282  J=1,4
      IF (TOAC(1,J).EQ.0) GO TO 282
      WRITE (6,112) (DEPT(COLL(15)+J,L),L=1,16),(CAP(J,K),K=1,5)
COMMENT: ADD CAPITOL CAMPUS TO REGIS SUBCATALOGUES.
      M=2
      IF (ISL.EQ.1) M=1
      DO 280  K=1,5
      UDEPT(ISL,15,J,K)=UDEPT(ISL,15,J,K)+CAP(J,K)
      CDEPT(15,J,K)=CDEPT(15,J,K)+CAP(J,K)
```

```
      IF(ISL.EQ.4)CDEPT(15,J,7)=CDEPT(15,J,7)+CAP(J,K)
      IF(ISL.EQ.2.OR.ISL.EQ.3.OR.ISL.EQ.5)CDEPT(15,J,6)=CDEPT(15,J,6)+
     *CAP(J,K)
      WRITE (15,278) J,(SILEV(ISL,L),L=1,16),MEGIS(COLL(15)+J),SUBCAT(ME
     1GIS(COLL(15)+J),M),CAP(J,K)
  278 FORMAT ('0','J=',I2,5X,16A1,5X,'MEGIS=',I4,5X,'SUBCAT=',F10.0,5X,'
     1CAP=',I10)
  280 SUBCAT(MEGIS(COLL(15)+J),M)=SUBCAT(MEGIS(COLL(15)+J),M)+CAP(J,K)
  282 CONTINUE
      WRITE (6,158)
      WRITE (6,138) (DDID(I,J),J=1,6)
      GO TO 316
C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
C        STARTING AT LABEL 111, WE ENTER A LOOP FROM LABEL 10 TO 10 LABEL
C        448 WHICH PRINTS THOSE NON-ZERO TABLES POINTED TO BY OUR LIST
C        OF POINTERS.  THE TABLES ARE PRINTED SIDE BY SIDE TO REDUCE
C        THE AMOUNT OF PAPER NEEDED.  THE LOOP IS SOMEWHAT INVOLVED
C        SINCE WE PRINT NO ZERO TABLES OR ROWS.  THIS MEANS THAT WE
C        MUST LOCATE TWO NON-ZERO ROWS BEFORE PRINTING.
C
C        A LINE COUNT IS KEPT TO AVOID PRINTING ONE TABLE ON TWO PAGES.
C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
  284 WRITE (6,132)
      WRITE (6,120) (DDID(NZPIK(I-2),K),K=1,5),(DDID(NZPIK(I-1),K),K=1,5
     1)
      WRITE (6,130) DDID(NZPIK(I-2),6),DDID(NZPIK(I-1),6)
  285 IF (NZPIK(I).EQ.999) GO TO 316
      IF (NZPIK(I+1).NE.999) GO TO 292
      IF (LNCT+16+NDEP(NZPIK(I)).LE.60) GO TO 288
      WRITE (6,162)
      LNCT=0
  288 WRITE (6,140) (DEP(COLL(NZPIK(I)),L),L=1,16)
      LNCT=LNCT+16
      MAT=NDEP(NZPIK(I))
      DO 290  J=1,MAT
      IF (IDAC(NZPIK(I),J).EQ.0) GO TO 290
      WRITE (6,112) (DEP(COLL(NZPIK(I))+J,L),L=1,16),(ACOEF(K,J,NZPIK(I))
     1,K=1,5)
      CALL NAME (NZPIK(I),J,ISL)
      LNCT=LNCT+1
  290 CONTINUE
      WRITE (6,144) (DDID(NZPIK(I),K),K=1,6)
      GO TO 316
  292 IF (LNCT+16+MAX0(NDEP(NZPIK(I)),NDEP(NZPIK(I+1))).LE.60) GO TO 294
      WRITE (6,162)
      LNCT=0
  294 WRITE (6,106) (DEP(COLL(NZPIK(I)),L),L=1,16),(DEP(COLL(NZPIK(I+1))
     1,L),L=1,16)
      WRITE (6,108)
      WRITE (6,118)
      LNCT=LNCT+16
      ND1=NDEP(NZPIK(I))
      ND2=NDEP(NZPIK(I+1))
      IW1=1
      IW2=1
```

```
      DO 298  J=IW1,ND1                                                  1272
      IF (TOAC(NZPTR(I),J).NE.0) GO TO 300                               1274
  298 CONTINUE                                                           1276
      IW1=999                                                            1278
      GO TO 302                                                          1280
  300 IW1=J+1                                                            1282
  302 IF (IW2.EQ.999) GO TO 308                                          1284
      DO 304  J=IW2,ND2                                                  1286
      IF (TOAC(NZPTR(I+1),J).NE.0) GO TO 306                             1288
  304 CONTINUE                                                           1290
      IW2=999                                                            1292
      GO TO 308                                                          1294
  306 IW2=J+1                                                            1296
  308 IF ((IW1.EQ.999).AND.(IW2.EQ.999)) GO TO 314                       1298
      IF (IW1.EQ.999) GO TO 310                                          1300
      IF (IW2.EQ.999) GO TO 312                                          1302
      WRITE (6,110) (DEP(COLL(NZPTR(I))+IW1-1,L),L=1,16),(ACOL(K,IW1-1,N 1304
     1ZPTR(I)),K=1,5),(DEP(COLL(NZPTR(I+1))+IW2-1,L),L=1,16),(ACOL(K,IW2 1306
     2-1,NZPTR(I+1)),K=1,5)                                              1308
      J=IW1-1                                                            1310
      CALL MARK (NZPTR(I),J,ISL)                                         1312
      J=IW2-1                                                            1314
      CALL MARK (NZPTR(I+1),J,ISL)                                       1316
      LNCT=LNCT+1                                                        1318
      GO TO 296                                                          1320
  310 WRITE (6,116) (DEP(COLL(NZPTR(I+1))+IW2-1,L),L=1,16),(ACOL(K,IW2-1 1322
     1,NZPTR(I+1)),K=1,5)                                                1324
      J=IW2-1                                                            1326
      CALL MARK (NZPTR(I+1),J,ISL)                                       1328
      LNCT=LNCT+1                                                        1330
      GO TO 302                                                          1332
  312 WRITE (6,112) (DEP(COLL(NZPTR(I))+IW1-1,L),L=1,16),(ACOL(K,IW1-1,N 1334
     1ZPTR(I)),K=1,5)                                                    1336
      J=IW1-1                                                            1338
      CALL MARK (NZPTR(I),J,ISL)                                         1340
      LNCT=LNCT+1                                                        1342
      GO TO 296                                                          1344
  314 I=I+2                                                              1346
      GO TO 284                                                          1348
  316 IF (LNCT.LT.30) WRITE (6,164)                                      1350
      IF (ICA.EQ.INDEX(1)) GO TO 322                                     1374
      IF(ICA.NE.INDEX(1).AND.SWITCH) ENDFILE 11
      WRITE (9,318) (CAMP(ICA,L),L=1,16),(ICT(L),L=1,6)                  1376
  318 FORMAT ('0',7X,16A1,5(9X,I6),13X,I8)                               1378
      DO 320  I=1,6                                                      1380
  320 ICT(I)=0                                                           1382
C                                                                        1352
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC 1354
C         AFTER PRINTING, CHECK TO SEE IF A NEW CAMPUS HAS BEEN          1356
C         ENCOUNTERED.  IF SO, OPEN A NEW FILE ON THE TAPE.  IF ALL      1358
C         RECORDS HAVE BEEN PROCESSED, PRINT THE NUMBER OF CREDITS       1360
C         PROCESSED IN THE RUN AND STOP.  OTHERWISE, RETURN TO THE       1362
C         INITIALIZATION PORTION.                                        1364
C                                                                        1366
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC 1368
C                                                                        1370
C         OUTPUT SECTION FOR PRP.
      CALL PRP(ICA,NDEP)
  322 CONTINUE                                                           1384
```

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```
      IF (ISL.EQ.6) GO TO 200                                          1386
      CALL PBP(22,NDEP)                                                1388
      WRITE (6,166) IYT                                                1390
      CONTINUE                                                         1392
      WRITE (9,318) (CAMP(ICA,L),L=1,16),(ICT(L),L=1,6)                1394
      WRITE (9,150) (IAUT(L),L=1,6)                                    1396
      WRITE (6,178) HEADER                                             1398
      WRITE (6,170)                                                    1400
      DO 324  I=1,6                                                    1402
  324 GTOTAL(I)=0.0                                                    1404
      DO 328  I=1,30                                                   1406
      XTOTAL=SUBCAT(I,1)+SUBCAT(I,2)                                   1408
      XGRAD=SUBCAT(I,1)/24.0                                           1410
      XUGRAD=SUBCAT(I,2)/30.0                                          1412
      XFTE=XGRAD+XUGRAD                                                1414
      GTOTAL(1)=GTOTAL(1)+SUBCAT(I,1)                                  1416
      GTOTAL(2)=GTOTAL(2)+SUBCAT(I,2)                                  1418
      GTOTAL(3)=GTOTAL(3)+XTOTAL                                       1420
      GTOTAL(4)=GTOTAL(4)+XGRAD                                        1422
      GTOTAL(5)=GTOTAL(5)+XUGRAD                                       1424
      GTOTAL(6)=GTOTAL(6)+XFTE                                         1426
      IF (I.GT.23) GO TO 326                                           1428
      WRITE (6,174) I,SUBCAT(I,1),SUBCAT(I,2),XTOTAL,XGRAD,XUGRAD,XFTE 1430
      GO TO 328                                                        1432
  326 IF (I.EQ.24) WRITE (6,178) HEADER                                1434
      WRITE (6,170)                                                    1436
      J=I+25                                                           1438
      WRITE (6,174) J,SUBCAT(I,1),SUBCAT(I,2),XTOTAL,XGRAD,XUGRAD,XFTE 1440
  328 CONTINUE                                                         1442
      WRITE (6,176) GTOTAL                                             1444
C                                                                      1446
C                                                                      1448
COMMENT: UNIVERSITY GRAND TOTALS BY COLLEGE OF ENROLLMENT OUTPUT SECTION. 1450
C                                                                      1452
C                                                                      1454
      WRITE (9,178) HEADER                                             1456
      DO 334  ISL=1,5                                                  1458
      DO 332  ICE=1,16                                                 1460
COMMENT: SKIP, IF GRAND TOTAL EQUALS ZERO.                             1462
      IF (OCHC(ISL,ICE,16,6).EQ.0) GO TO 332                           1464
      WRITE (9,168) (STLEV(ISL,L),L=1,16)                              1466
      WRITE (9,122) (DEP(COLL(ICE),L),L=1,16)                          1468
      WRITE (9,128)                                                    1470
      DO 330  K=1,15                                                   1472
      IF (OCHC(ISL,ICE,K,6).EQ.0) GO TO 330                            1474
      WRITE (9,124) (DEP(COLL(K),L),L=1,16),(OCHC(ISL,ICE,K,J),J=1,6)  1476
  330 CONTINUE                                                         1478
      WRITE (9,142) (OCHC(ISL,ICE,16,J),J=1,6)                         1480
  332 CONTINUE                                                         1482
  334 CONTINUE                                                         1484
C                                                                      1486
C                                                                      1488
COMMENT: UNIVERSITY GRAND TOTALS OF CREDIT LOADS ON DEPARTMENTS        1490
C              OUTPUT SECTION.                                         1492
C                                                                      1494
      DO 344  ISL=1,5                                                  1496
      DO 344  JCT=1,15                                                 1498
      WRITE (6,336) (STLEV(ISL,L),L=1,16)                              1500
  336 FORMAT ('1',20X,'UNIVERSITY TOTALS=',14X,16A1)                   1502
COMMENT: SKIP, IF GRAND TOTAL EQUALS ZERO.
```

```
      WRITE (6,140) (DEP(COLL(JCT),L),L=1,10)
      NU=NDEP(JCT)                                                      1506          06-13-73
      DO 338  L=1,NU                                                    1508
  338 WRITE (6,112) (DEP(COLL(JCT)+L,K),K=1,16),(ODEPT(ISL,JCT,L,K),K=1,  1510
     15)                                                                1512
      DO 340  L=1,NU                                                    1514
      DO 340  K=1,5                                                     1516
      ODEPT(ISL,JCT,22,K)=ODEPT(ISL,JCT,22,K)+ODEPT(ISL,JCT,L,K)        1518
  340 CONTINUE                                                          1520
      I=0                                                               1522
      DO 342  K=1,5                                                     1524
  342 I=I+ODEPT(ISL,JCT,22,K)                                           1526
      WRITE (6,144) (ODEPT(ISL,JCT,22,K),K=1,5),I                       1528
  344 CONTINUE                                                          1530
C                                                                       1532
      STOP                                                              1534
      END                                                               1536
C     EDITED 11/20/72 -- EDIT * VERSION 2.12 *                          1538
      SUBROUTINE BANK (IPIK,J,JSL)                                      1540
      REAL*4 SUBCAT(30,2)                                               1542
      INTEGER*4 CDEPT(15,22,8),NDEP(15)
      INTEGER*4 ODEPT(5,15,22,5),TOTD(13,6)                             1544
      INTEGER*4 ACOL(5,21,13),BEGIS(140),COLL(16)                       1546
      INTEGER*4 IBOO(24)                                                1548
      LOGICAL*1 CAMP(22,16),DEP(141,26)
      COMMON ACOL,ODEPT,CDEPT,SUBCAT,TOTD,COLL,BEGIS,CAMP,DEP
      DATA IBOO/54,53,50,54,50,50,51,55,53,50,50,52,50,55,50,55,53,18,53  1552
     1,55,55,55,55,50/                                                  1554
C                                                                       1556
C                                                                       1558
COMMENT: THIS SUBROUTINE ADDS CREDITS TO BOTH THE BEGIS SUBCATAGORIES   1560
C              AND TO THE CREDIT LOAD ON DEPARTMENTS TOTALS.            1562
C                                                                       1564
C                                                                       1566
      ISL=JSL                                                           1568
      ITEMP=BEGIS(COLL(IPIK)+J)                                         1570
      IF (ITEMP.GT.23) ITEMP=ITEMP-25                                   1572
      M=2                                                               1574
      IF (JSL.EQ.1) M=1                                                 1576
      DO 102  K=1,5                                                     1578
      IF (K.LT.5.OR.ACOL(K,J,IPIK).EQ.0) GO TO 100                      1580
      ITEMP=IBOO(ITEMP)                                                 1582
      IF (ITEMP.GT.23) ITEMP=ITEMP-25                                   1584
  100 CONTINUE                                                          1586
      SUBCAT(ITEMP,M)=SUBCAT(ITEMP,M)+ACOL(K,J,IPIK)                    1588
  102 CONTINUE                                                          1590
      DO 104  K=1,5                                                     1592
      CDEPT(IPIK,J,K)=CDEPT(IPIK,J,K)+ACOL(K,J,IPIK)
      IF(ISL.EQ.2.OR.ISL.EQ.3.OR.ISL.EQ.5)CDEPT(IPIK,J,6)=CDEPT(IPIK,J,6
     *)+ACOL(K,J,IPIK)
      IF(ISL.EQ.4)CDEPT(IPIK,J,7)=CDEPT(IPIK,J,7)+ACOL(K,J,IPIK)
      IF(ISL.EQ.1)CDEPT(IPIK,J,8)=CDEPT(IPIK,J,8)+ACOL(K,J,IPIK)
  104 ODEPT(ISL,IPIK,J,K)=ODEPT(ISL,IPIK,J,K)+ACOL(K,J,IPIK)            1594
      RETURN                                                            1596
      END                                                               1598
      SUBROUTINE PREP(ICA,NDEP)
      REAL*4 SUBCAT(30,2)                                               1542
      INTEGER*4 ODEPT(5,15,22,5),TOTD(13,6)                             1544
      INTEGER*4 CDEPT(15,22,8),NDEP(15)
      INTEGER*4 ACOL(5,21,13),BEGIS(140),COLL(16)                       1546
```

```
      LOGICAL*1 CAMP(22,16),DEPT(22,20)
      COMMON ACOL,ODEPT,CDEPT,SUBCAT,IOTD,COLL,REGIS,CAMP,DEP                    06-13-73
      N = 6
      M=20
      WRITE(N,412) (CAMP(ICA,L),L=1,16)
412   FORMAT('1',20X,'CAMPUS=',12X,16A1,//,21X,'TOTALS BY DEPARTMENT')
      DO 400 JCT=1,15
      NO=ODEP(JCT)
      DO 406 L=1,NO
      DO 406 K=1,M
      CDEPT(JCT,22,K)=CDEPT(JCT,22,K)+CDEPT(JCT,L,K)
405   CONTINUE
      I=0
      DO 408 K=1,5
408   I=I+CDEPT(JCT,22,K)
      IF(I.EQ.0)GO TO 400
      WRITE(N,414)(DEP(COLL(JCT),L),L=1,16)
      WRITE(M,420)(CAMP(ICA,L),L=1,16),(DEP(COLL(JCT),L),L=1,16),20,
     *(CDEPT(JCT,22,K),K=1,M),I
420   FORMAT(' ',32A1,I2,Y16)
414   FORMAT('2',10X,'CREDITS TAKEN IN COLLEGE OF ',16A1,//,8X,' DEPT',
     132X,'COURSE LEVEL',25X,'STUDENT LEVEL',//,30X,' 0 -399  400-499  5
     200-599  600-699  800-899  I  LD DIV   UP DIV   GR DIV')
      DO 402 L=1,NO
      WRITE(M,425)(DEP(COLL(JCT)+L,K),K=1,24),(CDEPT(JCT,L,K),K=1,M)
425   FORMAT(' ',24A1,8I6)
402   WRITE(N,404) (DEP(COLL(JCT)+L,K),K=1,24),(CDEPT(JCT,L,K),K=1,M)
404   FORMAT(' ',2X,24A1,2X,5(I6,3X),' I',3(I6,3X))
      WRITE(N,416) (CDEPT(JCT,22,K),K=1,M),I
416   FORMAT('+',102('_'),/,10X,' TOTALS',12X,5(I6,3X),' I',3(I6,3X),
     1/,10X,' GRAND TOTAL',7X,I6)
400   CONTINUE
      DO 410 J=1,15
      DO 410 K=1,22
      DO 410 L=1,M
410   CDEPT(J,K,L)=0
      RETURN
      END
/*
//DATA.FT10F001 DD DSN=OUT,VOL=SER=RM15,UNIT=2400,DCB=(RECFM=FB,      7460
//    LRECL=28,BLKSIZE=7000)                                          7470
//DATA.FT11F001 DD DSN=ONE,LABEL=(1,SL),UNIT=(2400,,DEFER),
//    VOL=SER=RM123,
//  DCB=(RECFM=VBS,LRECL=424,BLKSIZE=8484)                          7490
//DATA.FT11F002 DD DSN=TWO,LABEL=(1,SL),UNIT=(2400,,DEFER),
//    VOL=SER=RM124,
//  DCB=(RECFM=VBS,LRECL=424,BLKSIZE=8484)                          7510
//DATA.FT11F003 DD DSN=THREE,LABEL=(2,SL),VOL=REF=*.FT11F001,       7520
//  DCB=*.FT11F001                                                  7530
//DATA.FT11F004 DD DSN=FOUR,LABEL=(2,SL),VOL=REF=*.FT11F002,        7540
//  DCB=*.FT11F002                                                  7550
//DATA.FT11F005 DD DSN=FIVE,LABEL=(3,SL),VOL=REF=*.FT11F001,        7560
//  DCB=*.FT11F001                                                  7570
//DATA.FT11F006 DD DSN=SIX,LABEL=(3,SL),VOL=REF=*.FT11F002,         7580
//  DCB=(RECFM=VBS,LRECL=84,BLKSIZE=1684)                           7590
//DATA.FT11F007 DD DSN=SEVEN,LABEL=(4,SL),VOL=REF=*.FT11F001,       7600
//  DCB=*.FT11F001                                                  7610
//DATA.FT11F008 DD DSN=EIGHT,LABEL=(4,SL),VOL=REF=*.FT11F002,       7620
//  DCB=*.FT11F002                                                  7630
//DATA.FT11F009 DD DSN=NINE,LABEL=(5,SL),VOL=REF=*.FT11F001,        7640
```

```
//  DCB=*.FT11F001
//DATA.FT11F010 DD DSN=TEN,LABEL=(5,SL),VOL=REF=*.FT11F002,                    7660
//  DCB=*.FT11F002                                                            7670
//DATA.FT11F011 DD DSN=ONE,LABEL=(6,SL),VOL=REF=*.FT11F001,                    7680
//  DCB=*.FT11F001                                                            7690
//DATA.FT11F012 DD DSN=TWO,LABEL=(6,SL),VOL=REF=*.FT11F002,                    7700
//  DCB=*.FT11F002                                                            7710
//DATA.FT11F013 DD DSN=THREE,LABEL=(7,SL),VOL=REF=*.FT11F001,                  7720
//  DCB=*.FT11F001                                                            7730
//DATA.FT11F014 DD DSN=FOUR,LABEL=(7,SL),VOL=REF=*.FT11F002,                   7740
//  DCB=*.FT11F002                                                            7750
//DATA.FT11F015 DD DSN=FIVE,LABEL=(8,SL),VOL=REF=*.FT11F001,                   7760
//  DCB=*.FT11F001                                                            7770
//DATA.FT11F016 DD DSN=SIX,LABEL=(8,SL),VOL=REF=*.FT11F002,                    7780
//  DCB=*.FT11F002                                                            7790
//DATA.FT11F017 DD DSN=SEVEN,LABEL=(9,SL),VOL=REF=*.FT11F001,                  7800
//  DCB=*.FT11F001                                                            7810
//DATA.FT11F018 DD DSN=EIGHT,LABEL=(9,SL),VOL=REF=*.FT11F002,                  7820
//  DCB=*.FT11F002                                                            7830
//DATA.FT11F019 DD DSN=NINE,LABEL=(10,SL),VOL=REF=*.FT11F001,                  7840
//  DCB=*.FT11F001                                                            7850
//DATA.FT11F020 DD DSN=TEN,LABEL=(10,SL),VOL=REF=*.FT11F002,                   7860
//  DCB=*.FT11F002                                                            7870
//DATA.FT11F021 DD DSN=ONE,LABEL=(11,SL),VOL=REF=*.FT11F001,                   7880
//  DCB=*.FT11F001                                                            7890
//DATA.FT11F022 DD DSN=TWO,LABEL=(11,SL),VOL=REF=*.FT11F002,                   7900
//  DCB=*.FT11F002                                                            7910
//DATA.FT09F001 DD DCB=(RECFM=FBA,LRECL=133,BLKSIZE=133),SYSOUT=A              7920
//DATA.FT20F001 DD UNIT=(2400,,DEFER),DSN=BMT25,
//     VOL=SER=BM125,DCB=(RECFM=FB,LRECL=100,BLKSIZE=3300)
//DATA.FT15F001 DD DCB=(RECFM=FBA,LRECL=133,BLKSIZE=133),SYSOUT=A              7930
```

06-13-73

D: CONSUM-1 MODULE

In addition to the tape input of enrollment from the DISAG-1 module of the Student Flow Model, the user must supply the following card input for use in CONSUM-1 module:

1: Campus Name Card: Name of each campus, starting in column 3 with one campus per card and not exceeding 16 characters.

2: College Name Card: Name of each college or category of enrollment, starting in column 3 with one college per card.

3: Division-Level Cards: Name of each division-level starting in column 1 with one level per card.

4: Campus Conversion Card: Card listing the order of the campuses in accord with the output from DISAG-1:

0102030405060708091012131415161718192021221 1

Campus

Number	Name
1	Altoona
2	Allentown
3	Behrend
4	Berks
5	Beaver
6	Capitol
7	Delaware
8	DuBois
9	Fayette
10	Hazleton
11	King of Prussia
12	Mont Alto
13	McKeesport
14	New Kensington
15	Ogontz
16	Schuylkill
17	Worthington-Scranton
18	Shenango
19	University Park
20	Wilkes Barre
21	York
22	Hershey

5: College Conversion Card: Card listing the order of the colleges or categories of enrollment by number in accord with the output from DISAG-1:

0102030405060708101114121509 16

College of Enrollment and/or Instruction

Number	Name
1	Agriculture
2	Arts and Architecture
3	Business Administration
4	Education
5	Engineering
6	Health and Physical Ed.
7	Human Development
8	Liberal Arts
9	Medicine
10	Earth and Mineral Sciences
11	Science
12	Inter-College
13	R.O.T.C.
14	Division of Counseling
15	Capitol
16	Non-Degree

6: Average Course-Load Cards: The average course-load per year per headcount student by campus, college or category of enrollment, and division-level. One value per card in columns 26-30 with decimal point in column 29. (Sample shown in listing).

The CONSUM-1 program outputs onto tape the instructional activity in SCH per year by campus, college or category of enrollment, and division-level in order consistent with that required for ITER-1.

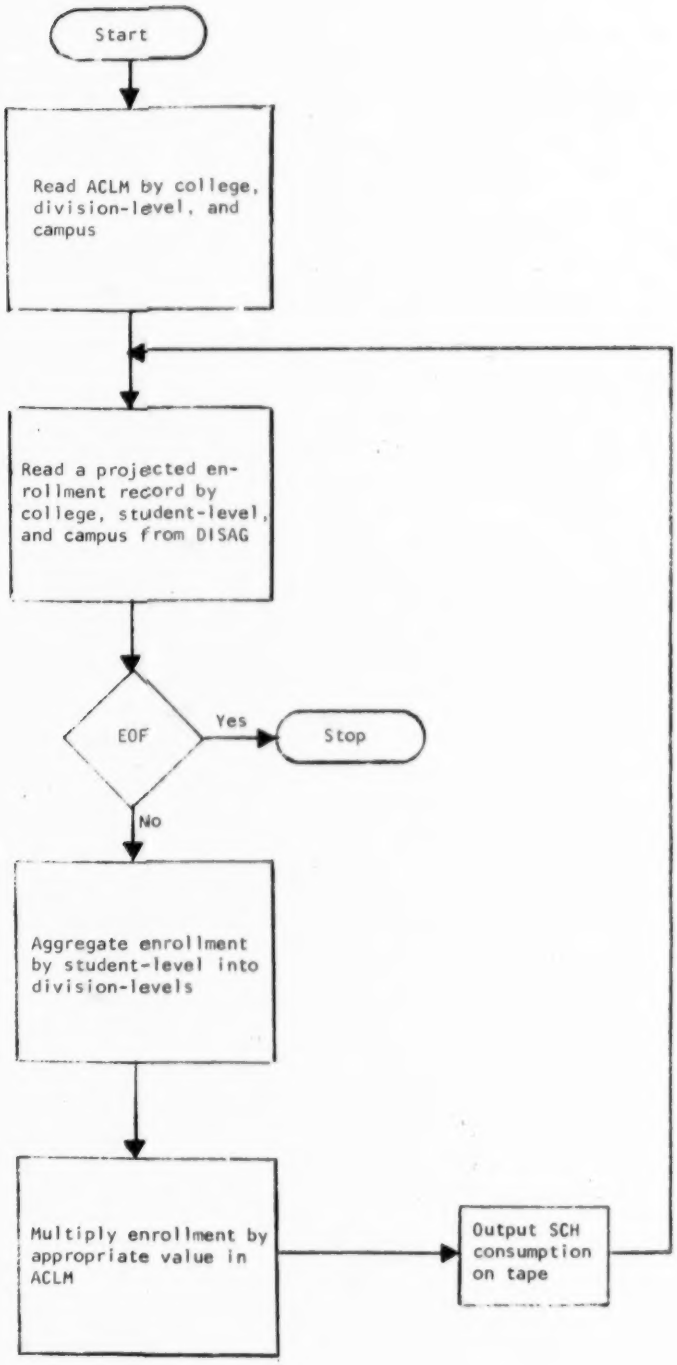
```
(1) AAALTOONA                                                    3500        06-12-73
    ANALLENTOWN                                                  3510
    BDBEHREND                                                    3520
    BKBERKS                                                      3530
    BRBEAVER                                                     3540
    CLCAPITOL                                                    3550
    DEDELAWARE                                                   3560
    DSDUBOIS                                                     3570
    FEFAYETTE                                                    3580
    HNHAZLETON                                                   3590
    MAMONT ALTO                                                  3600
    MKMCKEESPORT                                                 3610
    NKNEW KENSINGTON                                             3620
    OZOGANTZ                                                     3630
    SLSCHUYLKILL                                                 3640
    SNSCRANTON                                                   3650
    SUSCHENANGO                                                  3660
    UPUNIV. PARK                                                 3670
    WBWILKES BARRE                                               3680
    YKYORK
    HY HERSHEY
    KPKING OF PRUSSIA
(2) 13AGRICULTURE
     8ARTS & ARCH
     8BUSINESS ADM
     9EDUCATION
    14ENGINEERING
     1HEALTH & PE
     6HUMAN DEV
    21LIBERAL ARTS
     7EARTH & M S
    10SCIENCE
    00D.U.C.
     4INTER-COLLEGE
    04CAPITOL MAJOR
    14MEDICENE
    00NON-DEGREE
(3) GRADUATE
    ASSOCIATE
    LOWER DIVISION
    UPPER DIVISION
(4) ADJUNCT
    01020304050607080910121314151617181920212211
(5) 01020304050607081011141215091 6
(6)    1  1 1 GR   AGR  AA
       1  1 2 AS   AGR  AA     29.7
       1  1 3 LD   AGR  AA     27.2
       1  1 4 UD   AGR  AA     36.0
       1  1 5 ADJ  AGR  AA
       1  2 1 GR   AA   AA
       1  2 2 AS   AA   AA
       1  2 3 LD   AA   AA     35.5
       1  2 4 UD   AA   AA     36.0
       1  2 5 ADJ  AA   AA
       1  3 1 GR   BA   AA
       1  3 2 AS   BA   AA
       1  3 3 LD   BA   AA     32.2
       1  3 4 UD   BA   AA     36.0
       1  3 5 ADJ  BA   AA
       1  4 1 GR   ED   AA
```

1	4	3	LD	ED	AA	30.1
1	4	4	UD	ED	AA	36.0
1	4	5	ADJ	ED	AA	
1	5	1	GR	ENG	AA	
1	5	2	AS	ENG	AA	32.8
1	5	3	LD	ENG	AA	30.8
1	5	4	UD	ENG	AA	36.0
1	5	5	ADJ	ENG	AA	
1	6	1	GR	HPE	AA	
1	6	2	AS	HPE	AA	
1	6	3	LD	HPE	AA	33.6
1	6	4	UD	HPE	AA	36.0
1	6	5	ADJ	HPE	AA	
1	7	1	GR	HD	AA	
1	7	2	AS	HD	AA	24.9
1	7	3	LD	HD	AA	31.1
1	7	4	UD	HD	AA	36.0
1	7	5	ADJ	HD	AA	
1	8	1	GR	LA	AA	
1	8	2	AS	LA	AA	
1	8	3	LD	LA	AA	28.0
1	8	4	UD	LA	AA	36.0
1	8	5	ADJ	LA	AA	
1	9	1	GR	EMS	AA	
1	9	2	AS	EMS	AA	
1	9	3	LD	EMS	AA	34.2
1	9	4	UD	EMS	AA	36.0
1	9	5	ADJ	EMS	AA	
1	10	1	GR	SCI	AA	
1	10	2	AS	SCI	AA	
1	10	3	LD	SCI	AA	30.2
1	10	4	UD	SCI	AA	36.0
1	10	5	ADJ	SCI	AA	
1	11	1	GR	DOC	AA	
1	11	2	AS	DOC	AA	30.0
1	11	3	LD	DOC	AA	33.8
1	11	4	UD	DOC	AA	36.0
1	11	5	ADJ	DOC	AA	
1	12	1	GR	IC	AA	
1	12	2	AS	IC	AA	33.5
1	12	3	LD	IC	AA	
1	12	4	UD	IC	AA	
1	12	5	ADJ	IC	AA	
1	13	1	GR	CL	AA	
1	13	2	AS	CL	AA	
1	13	3	LD	CL	AA	
1	13	4	UD	CL	AA	
1	13	5	ADJ	CL	AA	
1	14	1	GR	MED	AA	
1	14	2	AS	MED	AA	
1	14	3	LD	MED	AA	
1	14	4	UD	MED	AA	
1	14	5	ADJ	MED	AA	
1	15	1	GR	ND	AA	
1	15	2	AS	ND	AA	
1	15	3	LD	ND	AA	
1	15	4	UD	ND	AA	
1	15	5	ADJ	ND	AA	21.4
2	1	1	GR	AGR	AN	

2	1	2	AS	AGR	AN	
2	1	3	LD	AGR	AN	30.0
2	1	4	UD	AGR	AN	36.0
2	1	5	ADJ	AGR	AN	
2	2	1	GR	AA	AN	
2	2	2	AS	AA	AN	32.0
2	2	3	LD	AA	AN	36.0
2	2	4	UD	AA	AN	
2	2	5	ADJ	AA	AN	

FIGURE D-1

MACRO FLOW CHART FOR CONSUM-1


Start
Read ACLM by college, division-level, and campus
Read a projected enrollment record by college, student-level, and campus from DISAG
EOF
Yes
Stop
No
Aggregate enrollment by student-level into division-levels
Multiply enrollment by appropriate value in ACLM
Output SCH consumption on tape

```
//          'UBL50,I=50,K=2500','ALLMAN D M',MSGLEVEL=2                    02-21-73
//          TAPE=RM114,OUT
//          TAPE=RM117,IN
//          END OF TAPE CARDS
// EXEC FLCG
//SOURCE.INPUT DD *
      IMPLICIT INTEGER (A-Z)
      REAL*8 CAMNAM(22,2),COLL(15,2),LEVEL(5,2)
      LOGICAL*4 SWITCH,TAPE
      REAL SC
      REAL*4 CREDIT(22,15,5)
      INTEGER*4 RCAMP(22),RCOLL(15)
      INTEGER*4 INPUT(8)
C                                                                       C
C                                                                       C
C                     USE OF LOGICAL VARIABLES:                         C
C                                                                       C
C          VARIABLE SWITCH          IF .TRUE. OUTPUT FOR PRINTER        C
C                                   IS GENERATED.                       C
C          VARIABLE  TAPE           IF .TRUE. INPUT FOR CREDIT MODEL    C
C                                   IS RETRIEVED FROM TAPE.             C
C                                                                       C
C                     SPECIFICATION INPUT ARRAY.                        C
C                                                                       C
C          INPUT(1)         ASSC STUDENTS, LEVEL 1.                     C
C          INPUT(2)         ASSC STUDENTS, LEVEL 2.                     C
C          INPUT(3)         BACC STUDENTS, LEVEL 1.                     C
C          INPUT(4)         BACC STUDENTS, LEVEL 2.                     C
C          INPUT(5)         BACC STUDENTS LEVEL 3.                      C
C          INPUT(6)         BACC STUDENTS, LEVEL 4.                     C
C          INPUT(7)         GRAD STUDENTS.                              C
C          INPUT(8)         AUDITED STUDENTS.                           C
C                                                                       C
C                                                                       C
C                                                                       C
C*********************************** INITIALIZATION SECTION ************
C
      SWITCH=.FALSE.
      SWITCH=.TRUE.
      TAPE=.TRUE.
      TAPE=.FALSE.
      L=11
      C=22
      S=15
CONNECT: READ CAMPUS, COLLEGE, AND STUDENT LEVEL NAMES.
      READ(5,15)((CAMNAM(C,J),J=1,2),C=1,22)
      READ(5,15)((COLL(S,J),J=1,2),S=1,15)
15    FORMAT(22A8)
      READ(5,10)((LEVEL(L,J),J=1,2),L=1,5)
10    FORMAT(2A8)
C                                                                       D-7
CONNECT: READ RICE PROGRAMMER'S ORDER OF CAMPUSES AND COLLEGES.
C
      READ(5,20)(RCAMP(J),J=1,22)
      READ(5,20)(RCOLL(J),J=1,15)
20    FORMAT(40I2)
C
```

```
C     COMMENT: PRINT CAMPUS AND COLLEGE CONVERSION TABLES FROM
C              STUDENT FLOW MODEL TO STUDENT CREDIT HOUR MODEL.
C
      IF(SWITCH)WRITE(6,22)
22    FORMAT('2',25X,'CAMPUS CONVERSION TABLE')
      IF(SWITCH)WRITE(6,25)(J,XCAMP(J),J=1,22)
      IF(SWITCH)WRITE(6,1)
1     FORMAT('1')
      IF(SWITCH)WRITE(6,23)
23    FORMAT('2',25X,'COLLEGE CONVERSION TABLE')
      IF(SWITCH)WRITE(6,25)(J,XCOLL(J),J=1,15)
25    FORMAT(' ',25X,3(I5,4X,'--',2X,A3,3X))
C
C     COMMENT: READ IN AVERAGE CREDIT HOURS.
C
      I=0
      DO 100 C=1,6
      DO 100 S=1,5
      DO 100 L=1,5
      READ(2,101)CREDIT(C,S,L)
101   FORMAT(25F3.0)
      I=I+1
      IF(SWITCH)WRITE(6,102)I,(CAMP(C),(LEVEL(L,J),J=1,2),(COLL(S,J),J=1,
     *LEVEL(L,J),J=1,2),CREDIT(C,S,L)
102   FORMAT(' ',I4,',',5A,',',5A,2(',',5A),',',5A,',AVERAGE CREDIT L  =',
     *F7.2)
100   CONTINUE
C
C*****************************************************************
C     COMMENT:  PREPARE 1 PUT FOR CREDIT MODEL.
C
200   READ(14,201,END=1000)T,C,S,INPUT
201   FORMAT(3I2,9X,I3)
C
C     COMMENT: CALCULATE GRADUATE SCH.
C
      SCH=INPUT(7)*CREDIT(C,S,1)
      L=1
      IF(IAPE.AND.SCH.NE.0.0)WRITE(61,203)T,XCAMP(C),XCOLL(S),L,SCH,
     1INPUT(7)
203   FORMAT(3I2,F10.2,I10)
C
C     COMMENT: CALCULATE ASSOCIATE SCH.
C
      SCH=(INPUT(1)+INPUT(2))*CREDIT(C,S,2)
      INPUT(1)=INPUT(1)+INPUT(2)
      L=2
      IF(IAPE.AND.SCH.NE.0.0)WRITE(61,203)T,XCAMP(C),XCOLL(S),L,SCH,
     1INPUT(1)
C
C     COMMENT: CALCULATE LOWER DIVISION BACC SCH.
C
      SCH=(INPUT(3)+INPUT(4))*CREDIT(C,S,3)
      INPUT(3)=INPUT(3)+INPUT(4)
      L=3
      IF(IAPE.AND.SCH.NE.0.0)WRITE(61,203)T,XCAMP(C),XCOLL(S),L,SCH,
     1INPUT(3)
C
C     COMMENT: CALCULATE UPPER DIVISION BACC SCH.
C
```

```
      SCH=(INPUT(5)+INPUT(6))*CREDIT(C,S,4)
      L=4
      INPUT(5)=INPUT(5)+INPUT(6)
      IF(TAPE.AND.SCH.NE.0.0)WRITE(61,202)Y,SCAMP(C),SCELL(S),L,SCH,
     1INPUT(5)
C
C     CURRENT: CALCULATE ADJUNCT SCH.
C
      SCH=INPUT(8)*CREDIT(C,S,5)
      L=5
      IF(TAPE.AND.SCH.NE.0.0)WRITE(61,202)Y,SCAMP(C),SCELL(S),L,SCH,
     1INPUT(5)
      GO TO 200
  100 CONTINUE
      STOP
      END
/*          THIS IS A SLASH ASTERISK CARD
//DATA.FT14F001 DD UNIT=(2400,,DEFER),DSN=BATCH4,VOL=SER=BATCH4,DISP=OLD,
//    DCB=(RECFM=FB,LRECL=80,BLKSIZE=3200)
//DATA.FT11F001 DD DSN=BATCH7,UNIT=(2400,,DEFER),VOL=SER=BATCH7,
//      DCB=(RECFM=FB,LRECL=80,BLKSIZE=3200)
//DATA.INPUT DD *
```

E: ITER-1 MODULE

In addition to the ICLM coefficients from HIST-1 and the instructional activity consumption values from CONSUM-1, both on tape, the user must supply the following card input for use of the ITER-1 Module:

1: Header Card. One card defining the first line of output on each page,

i.e. PROJECTED SCH PRODUCTION: 1973-74.

2: Campus Name Cards: Same as INDEX-1 and HIST-1.

3: Division-Level Cards: Same as INDEX-1 and HIST-1.

4: Department and College Name Cards: Same as INDEX-1 and HIST-1.

Since projections are run for one year at a time, only one year of SCH consumption values is used per run. The information needed for the corresponding DD card for each projection year is as follows:

Projection Year	DS Name	Label
Base Year	YONE	1
Base Year +1	YTWO	2
Base Year +2	YTHR	3
Base Year +3	YFOU	4
Base Year +4	YFIV	5
Base Year +5	YSIX	6
Base Year +6	YSEV	7
Base Year +7	YEIG	8
Base Year +8	YNIN	9
Base Year +9	YTEN	10

The DD Card for 1977 using 1971 as a base year where the tape is BMT 18 is as follows:

```
//DATA.FT10F001 DD UNIT=(2400,,DEFER),
//  VOL=SER=BMT18,DSN=YSEV,LABEL=(7,SL)
```

The unit number is always 10.

The ITER-1 program produces the general purpose and special purpose output in hard copy form and in addition the special purpose output for internal budget application is produced on tape.

(2)
ALTOONA
ALLENTOWN
BEHREND
BERKS
BEAVER
CAPITOL
DELAWARE
DUBOIS
FAYETTE
HAZLETON
KING OF PRUSSIA
MONT ALTO
MCKEESPORT
NEW KENSINGTON
OGANTZ
SCHUYLKILL
SCRANTON
SHENANGO
UNIVERSITY PARK
WILKES BARRE
YORK
HERSHEY

(3)
GRADUATE
ASSOCIATE DEGREE
LOWER DIVISION
UPPER DIVISION
ADJUNCT

(4)

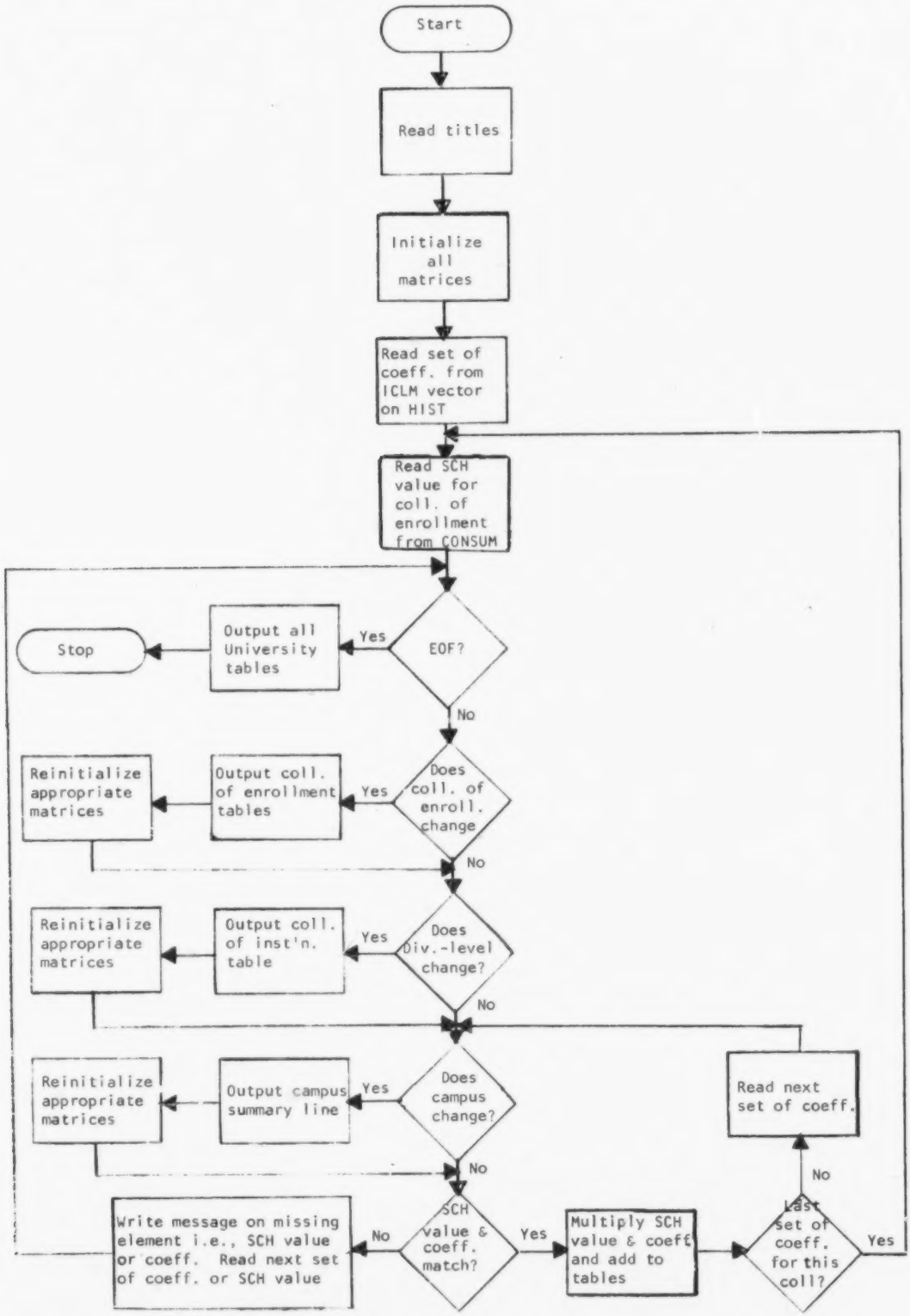
1AGRIC ECO	204-08	01*	04,06,18,78,95
2AGRIC EDUC	204-10	08	12,58
3AGRIC ENG	204-12	09	14
4ENTOMOLOGY	204-13	04	51,
5AGRONOMY	204-15	01	24,
6PLANT PATH	204-16	04	69,
7ANIMAL SCI	204-17	01	28,30
8DAIRY SCI	204-37	01	48
9FORESTRY	204-53	01*	54,55,57,84,85,85,98,99
10HORTIC	204-66	01	63
11PLTRY SCI	204-77	01	72
12VET SCI	204-88	04	81
13INTER DEPT	204-00	01*	35,50,52,70
13AGRICULTURE			
1GEN EDUC	205-07	10	40
2ARCH	205-11	02	10
3ART HIST	205-14	10	25
4LAND ARCH	205-33	02	50
5MUSIC	205-38	10	60
6ART	205-44	10	15,47
7THEATRE	205-48	10	70
8INTER DEPT	205-00	10	35
8ARTS & ARCH			
1ACCOUNTING	206-11	05	01
2BUS LOG	206-15	05	12,15,47
3FINANCE	206-19	05	40
4INS & R E	206-24	05	43,45,56
5MGT SCI	206-35	05	20,50,58
6MARKETING	206-36	05	55
7INTER-DEPT	206-00	05	10,30,35,68,70
8BUS		05	08
8BUSINESS ADM			

1AC CURR & T EXT	212-00	08	
2ART ED	212-08	08	01
3ED PSYC	212-10	08	22
4ED POLICY	212-12	08	12,14,20,36,64
5VOC ED	212-14	08	04,48,49,68,74,86
6HOME ECO ED	212-21	08	38
7MUSIC ED	212-24	08	52
8SPEC ED	212-36	08	15,18,80,82
9INTER-DEPT	212-00	08	16
9EDUCATION			
1AERO ENG	215-14	09	05
2ARCH ENG	215-17	09	15
3AGRIC ENG		09	10
4CHEM ENG	215-19	09	17
5CIVIL ENG	215-21	09	20,22,70
6ELECT ENG	215-31	09	2527
7ACOUSTICS	215-33	09	37
8ENG MECH	215-37	09	45
9ENG SCI	215-38	09	50,51
10IND ENG	215-44	09	55,56
11MECH ENG	215-51	09	60,62
12GEN ENG	215-55	09	40,52,71,73,75,80,81,83,85,88,90
13NUCL ENG	215-56	09	65
14INTER-DEPT	215-00	09	35
14ENGINEERING			
1HPE INSTRN	22 -11	08*	01,03,10,30,10
1HEALTH & PE			
1IND & FAM STUD	218-11	13	01,20,40,81,82
2BIOL HLTH	218-12	12*	02,30,60,89,90
3BIOL NURS	218-13	12	88
4COMM DEV	218-14	21	07,85
5MAN-ENVIR	218-15	13*	05,10,15,18,35,75,77,87,95,97
6INTER-DEPT	218-00	21	80
6HUMAN DEV			
1GEN EDUC	221-07	15*	36,40,86
2ANTHRO	221-12	22	04
3CLASSICS	221-15	11	10,11,30,32,52
4ECONOMICS	221-18	22	16
5ENGLISH	221-24	15	18
6FRENCH	221-28	11	22
7GERMAN	221-31	11	28
8HISTORY	221-34	22	34
9JOURNALISM	221-41	06	01,46,87,91
10LABOR STUD	221-43	05	51
11LINGUISTICS	221-46	15	59
12PHILOSOPHY	221-51	15	60
13POL SC & PUB AD	221-543722		20,64,68,72,74
14PSYCHOLOGY	221-55	20	70
15RELIG STUD	221-56	15	76
16SLAVIC	221-59	11	57,62,78,80,82,84,98
17SOCIOLOGY	221-64	22	90,92
18SP IT & POR	221-66	11	44,66,94
19SPEECH	221-67	15	89,96
20INTER-DEPT	221-05	49	02,06,09,12,13,24,26,54,56,58,61,88
21INTERDIS LA		49	03,23,25,63,71
21LIBERAL ARTS			
1ANATOMY	217-12	04	05
2ANESH	217-14	12	07
3COMP MED	217-15	12	22,40
4BEHAV SCI	217-18	12	10

```
 3BIOL CHEM          224-22  12
 6FAM MED            217-25  12      30
 7MEDICINE           217-41  12*     20,60,62
 8OBSTETRICS         217-47  12      65
 9PATHOLOGY          217-49  04      70
10PEDIATRICS         217-51  12      72
11PHARMA             217-52  04      75
12PSYCH              217-59  12      80
13RADIOL             217-62  12      82
14SURGERY            217-67  12      90
14MEDICINE
 1GEOGRAPHY          224-12  22      16
 2METEOROLOGY        224-18  19      40
 3GEOSCIENCES        224-19  19      04,12,20,28,32,60,64
 4MIN ECO            224-24  19      44
 5 MIN ENG           224-25  09      45,46,56,72,76,78,80,84,92
 6MAT SCI & CONST    224-3620 09*    01,08,33,34,36,52,86,88,90
 7INTER-DEPT         224-00  19      06
 7EARTH & M S
 1GEN EDUC           228-07  04*     13,60,70,90
 2ASTRONOMY          228-09  19      01
 3BIOCHEM            228-12  04      10,12
 4BIOLOGY            228-15  04      14,15,96
 5CHEMISTRY          228-21  19      20
 6COMP SCI           228-28  07      25,97
 7MATH               228-44  07      05,30,32
 8MICRO              228-46  04*     40,55
 9PHYSICS            228-54  19      65
10STATISTICS         228-74  17      29,92
10SCIENCE
 1 ENV POL CONT      231-20  49      07
 2REG PL & ADM       231-22  49*     05,16
 3PHY GEN SP EE      232-01  04*     10,12,15,18
 4STS,LAS            231-09  49      20,90
 4INTER-COLLEGE
 1ROTC               287-XX  18      01,10,20
 1ROTC
 1DOC
 1DOC
 1HUM,SO SC & ED     260-10  22*                     3090
 2ENG & TECH         260-20  09*                     3100
 3BUS & ADM          260-30  05*                     3110
 4MATH               260-90  07*                     3120
 4CAPITOL
 1ADJUNCT
 2NON-DEGREE GRAD
 3CONTINUING EDUC
 3NONDEGREE
 0
/*        THIS IS A SLASH ASTERISK CARD
```

FIGURE E-1

MACRO FLOW CHART FOR ITER-1



```
//                TAPE=BMT23,OUT
//                TAPE=BMT24,OUT
//                TAPE=BMT18,OUT
//                TAPE=BMT21,IN
//                END OF TAPE CARDS
// EXEC PGM=WTLOG
//STEPLIB DD DSN=SYS1.PSUICES.MODULLIB,UNIT=2314,VOL=SER=MODCON,
// DISP=SHR
//FT06F001 DD SYSOUT=A
//FT07F001 DD SYSOUT=B
//FT05F001 DD *
PROJECTED
  CREDITS
1974-75
/*        THIS IS A SLASH ASTERISK CARD
// EXEC FGCG
//SOURCE.INPUT DD *
C     FIFTED 11/20/72 -- FIFT * VERSION 2.12 *                                  0002
C                                                                               0004
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC  0006
C                                                                               0008
C                                                                               0010
C                    "USER'S GUIDE FOR ITER"                                    0012
C                                                                               0014
C         IN ORDER TO USE THE MODULE ITER, ONE MUST ONLY CHANGE A JOB           0016
C         CONTROL LANGUAGE CARD TO SPECIFY THE YEAR OF THE ENROLLMENT           0018
C         TO BE USED IN THIS PARTICULAR RUN.  THESE ARE DD CARDS FOR            0020
C         THE DATA STATEMENT FT10F001.  THE CARD WILL BE INSERTED               0022
C         IMMEDIATELY FOLLOWING THE END STATEMENT OF THE PROGRAM.               0024
C                                                                               0026
C         A COMPLETE SET OF THE CARDS NECESSARY TO RUN THE PROGRAM FOR          0028
C         A TEN YEAR PERIOD IS INCLUDED IN THE DECK.                            0030
C                                                                               0032
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC  0034
C                                                                               0036
C                                                                               0038
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC  0040
C                                                                               0042
C                                                                               0044
C         THIS SECTION OF THE PROJECT, THE ITERATION PART, IS DESIGNED          0046
C         TO DO THE ACTUAL PREDICTIONS FOR THE ENROLLMENT MODELS OF             0048
C         FUTURE YEARS.  IT USES THE COFFICIENT MATRICES WHICH WERE PUT         0050
C         ON TAPE IN THE HISTORICAL MODULE AND THE ENROLLMENT MODEL IS          0052
C         ALSO ON TAPE.                                                         0054
C                                                                               0056
C         A CARE IS READ FROM THE ENROLLMENT MODEL AND A MATRIX OF              0058
C         COFFICIENTS IS RETRIEVED FROM TAPE.  THIS SECTION OF THE              0060
C         ENROLLMENT MODEL CONTAINS FIVE BITS OF INFORMATION:                   0062
C              1) YEAR OF THE MODEL                                             0064
C              2) CAMPUS INDEX                                                  0066
C              3) COLLEGE OF ENROLLMENT INDEX                                   0068
C              4) STUDENT LEVEL INDEX                                           0070
C              5) NUMBER OF CREDITS TAKEN BY THIS GROUP OF STUDENTS             0072
C         AT THIS POINT, WE DO A CHECK ON THE INFORMATION TO BE                 0074
C         SURE THAT THE TWO PIECES OF DATA ARE THE SAME.  IF NOT, AN            0076
C         APPROPIATE MESSAGE IS PRINTED AND PROCESSING IS CONTINUED.            0078
C                                                                               0080
C         IF THEY DO CORRESPOND, THE NUMBER OF CREDITS TAKEN BY THIS            0082
C         GROUP IS MULTIPLIED BY THE MATRIX OF COFFICIENTS.  THIS MATRIX        0084
```

```
C     OF CREDITS IS THEN MADE                                          0088
C     INDICATORS ARE ALSO KEPT IN THIS MODULE AS IN THE HISTORICAL     0090
C     MODULE.                                                          0092
C                                                                      0094
C     WHENEVER THE COLLEGE OF ENROLLMENT CHANGES, A MATRIX OF          0096
C     CREDITS IS OUTPUT WHICH TELLS HOW MANY CREDITS ARE TAKEN         0098
C     IN THE VARIOUS COLLEGES BY STUDENTS IN THIS COLLEGE OF           0100
C     ENROLLMENT.  THEN AS THE STUDENT LEVEL CHANGES A SET OF THIR-    0102
C     TEEN MATRICES  REPRESENTING THE COLLEGES TAUGHT IS OUTPUT.       0104
C     THIS BREAKS DOWN THE CREDITS TAKEN IN EACH COLLEGE, NOT BY       0106
C     COLLEGE OF ENROLLMENT BUT BY STUDENT LEVEL.                      0108
C     AGAIN ZERO MATRICES AND ROWS ARE SURPRESSED EXACTALY AS IN THE   0110
C     HISTORICAL MODULE.                                               0112
C                                                                      0114
C     VARIABLE USES FOUND IN THIS MODULE ARE SIMILAR TO THOSE USED     0116
C     IN THE HISTORICAL MODULE.                                        0118
C     SOME OF THE VARIABLES AND ARRAYS USED IN THE PROGRAM ARE:        0120
C                                                                      0122
C          INDEX===> THE SET OF INDICES PASSED FROM THE FIRST MODULE   0124
C                    THIS SET COMPLETELY SPECIFIES THE RECORD.         0126
C                                                                      0128
C       INDEX NUMBER          INFORMATION IN INDEX                     0130
C          INDEX(1) ===>         CAMPUS INDEX                        0132
C          INDEX(2) ===>         NUMBER OF COLLEGE OF ENROLLMENT     0134
C          INDEX(3) ===>         COURSE LEVEL INDICATOR              0136
C          INDEX(4) ===>         INDEX TO COLLEGE TAKEN              0138
C          INDEX(5) ===>         INDEX TO DEPARTMENT TAKEN           0140
C          INDEX(6) ===>         NUMBER OF CREDITS TAKEN             0142
C          INDEX(7) ===>         STUDENT LEVEL INDICATOR             0144
C                                                                     0146
C                                                                     0148
C          CBC ===> AN INTEGER TABLE USED TO KEEP COUNT OF THE        0150
C                   NUMBER OF CREDITS TAKEN BY A PARTICULAR COLLEGE   0152
C                   OF ENROLLMENT IN EACH OF THE THIRTEEN COLLEGES    0154
C                   TAUGHT.                                           0156
C                                                                     0158
C          ACOL ===>A THREE DIMENSIONAL ARRAY TO KEEP CREDITS         0160
C                   TAKEN IN PARTICULAR DEPARTMENTS.  THERE IS        0162
C                   A MATRIX FOR EACH COLLEGE TAUGHT.                 0164
C                                                                     0166
C          CAP===>  THIS MATRIX PERFORMS THE SAME FUNCTION AS THE     0168
C                   ARRAY ACOL BUT THIS IS A SPECIAL CASE FOR         0170
C                   CAPITOL CAMPUS.                                   0172
C                                                                     0174
C          SCOL===> AN ARRAY SIMILAR TO ACOL BUT THESE MATRICES       0176
C                   HOLD CREDITS TAKEN BY A PARITCULAR COLLEGE OF     0178
C                   ENROLLMENT WHEREAS ACOL HAS ALL CREDITS FOR       0180
C                   PARTICULAR STUDENT LEVEL.  THESE MATRICES THEN    0182
C                   PARTICULAR STUDENT LEVEL.  THESE MATRICES THEN    0184
C                   THESE COFFICIENTS ARE THEN PUT ON TAPE, A         0186
C                   SEPARATE FILE FOR EACH CAMPUS.                    0188
C                                                                     0190
C          SCAP===> THIS IS THE COFFICIENT MATRIX FOR CAPITOL         0192
C                                                                     0194
C          TAB===>  THIS ARRAY IS USED TO INDICATE WHICH OF THE       0196
C                   MATRICES IS ZERO AND NEED NOT BE PRINTED.         0198
C                                                                     0200
C          NDEP===> THIS ARRAY HOLDS THE NUMBER OF DEPARTMENTS IN     0202
C                   THE CORRESPONDING COLLEGE.                        0204
C
```

```
C                 IOTO,IOTA,IOAC---> THESE ARRAYS HOLD CODES FOR
C                                    OF VARIOUS ARRAYS.  THIS INFORMATION
C                                     IS USED TO ELIMINATE UNNECESSARY
C                                    PRINTING.
C
C
C               IND ===> A SET OF FIVE NUMBERS WHICHA RE USED TO IDENTIFY
C                        THE TABLE OF COFFICIENTS WHICH FOLLOW IT.
C                        THEY ARE:
C
C                              INDEX NUMBER    INFORMATION STORED
C                                 IND(1)          CAMPUS INDEX
C                                 IND(2)          STUDENT LEVEL
C                                 IND(3)          COLLEGE OF ENROLLMENT
C                                 IND(4)          COLLEGE TAKEN
C                                 IND(5)          NEXT COLLEGE TAKEN
C
C               THE FOLLOWING THREE LISTS ARE USED FOR OUTPUT ONLY AND
C               ARE NOT MANDATORY FOR THE PROPER FUNCTIONING OF THE
C               PROGRAM
C
C               DEP===>THIS HOLDS A LIST OF ALL COLLEGES AT THE UNIVER-
C                      SITY AND THE RESPECTIVE LISTS OF DEPARTMENTS
C                      FOR EACH COLLEGE
C
C               CAMP===>LIST OF ALL CAMPUS NAMES
C
C               STLEV===>THIS LIST IS INITIALIZED TO HOLD THE FIVE
C                        STUDENT LEVELS
C          THERE ARE TWO SETS OF CODES USED IN THE PROGRAM.  THE FIRST
C          IS THE STUDENT LEVEL CODE WHICH HAS FIVE COMPONENTS.
C          THEY ARE:
C
C               STUDENT LEVEL        TYPE OF STUDENT
C                  1   ===>           GRADUATE
C                  2   ===>           ASSOCIATE DEGREE
C                  3   ===>           LOWER DIVISION
C                  4   ===>           UPPER DIVISION
C                  5   ===>           ADJUNCT
C
C          THE SECOND CODE IS FOR COURSE LEVELS.  AGAIN THERE ARE FIVE
C          CLASSIFICATIONS WHICH ARE:
C
C               COURSE LEVEL         COURSE NUMBER
C                  1   ===>            0 - 399
C                  2   ===>            400 - 499
C                  3   ===>            500 - 599
C                  4   ===>            600 - 699
C                  5   ===>            800 - 899
C
C
C
C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
  100 FORMAT (16A1)
  102 FORMAT (4I2,F10.2)
  104 FORMAT ('1',///,11X,'CAMPUS=',23X,16A1)
  106 FORMAT ('3',15X,'MISSING COFFICIENT MATRIX FOR THE FOLLOWING:',//,
     125X,'CAMPUS=',18X,16A1,/,26X,'STUDENT LEVEL=',11X,16A1,/,26X,'COLL
```

```
      ZERO OF ENROLLMENT= ',5X,16A1)
  108 FORMAT ('0',10X,'STUDENT LEVEL=',16X,16A1)                          0328
  110 FORMAT ('0',6(/),2(10X,'CREDITS TAKEN IN COLLEGE OF ',16A1,8X))     0330
  112 FORMAT ('0',7X,'DEPT',22X,'COURSE LEVEL',28X,'DEPT',22X,'COURSE LE  0332
     1VEL'//)                                                             0334
  114 FORMAT (' ',2X,16A1,2X,5(I6,3X),4X,16A1,2X,5(I6,3X))                0336
  116 FORMAT (' ',2X,16A1,2X,5(I6,3X))                                    0338
  118 FORMAT (' ',69X,16A1,2X,5(I6,3X))                                   0340
  120 FORMAT (' ',20X,' 0 -399  400-499  500-599  600-699  800-899',26X,  0342
     1' 0 -399  400-499  500-599  600-699  800-899')                      0344
  122 FORMAT ('0',5X,'TOTALS',9X,5(I6,3X),7X,'TOTALS',9X,5(I6,3X))        0346
  124 FORMAT ('0',35X,'CREDITS TAKEN BY STUDENTS ENROLLED IN COLLEGE OF'  0348
     1,1X,16A1)                                                           0350
  126 FORMAT ('0',20X,16A1,5X,5(I6,4X),'|',I6)                            0352
  128 FORMAT ('2',20X,'CAMPUS=',12X,16A1,/,21X,'STUDENT LEVEL=',5X,16A1,  0354
     1/,21X,'YEAR=',13X,I5)                                               0356
  130 FORMAT ('0',40X,' 0 -399   400-499   500-599   600-699   800-899    0358
     1  | TOTALS')                                                        0360
  132 FORMAT (' ',5X,'GRAND TOTAL ',3X,I6,46X,'GRAND TOTAL',4X,I6)        0362
  134 FORMAT ('+',20X,46('_'),20X,46('_'))                                0364
  136 FORMAT (' ',7(/),10X,'CREDITS TAKEN IN COLLEGE OF CAPITOL',//,7X,'  0366
     1DEPT',22X,'COURSE LEVEL',///,20X,' 0 -399  400-499  500-599  600-6  0368
     299  800-899')                                                       0370
  138 FORMAT ('0',5X,'TOTALS',9X,5(I6,3X),/,6X,'GRAND TOTAL',4X,I6)       0372
  140 FORMAT ('0',6(/),10X,'CREDITS TAKEN IN COLLEGE OF ',16A1,//,7X,'DE  0374
     1PT',22X,'COURSE LEVEL',//,20X,' 0 -399  400-499  500-599  600-699   0376
     2 800-899')                                                          0378
  142 FORMAT ('+',40X,60('_'),//,25X,'TOTALS',11X,5(I6,4X),'|',I6)        0380
  144 FORMAT ('+',20X,46('_'),/,6X,'TOTALS',9X,5(I6,3X),/,6X,'GRAND TOTA  0382
     1L',4X,I6)                                                           0384
  146 FORMAT (I2,24A1,I2)                                                 0386
  148 FORMAT ('1',20X,'LIST OF COLLEGES AND DEPARTMENTS')                 0388
  150 FORMAT ('2',10X,'DEPARTMENTS IN COLLEGE OF ',16A1)                  0390
  152 FORMAT (' ',25X,26A1)                                               0392
  154 FORMAT ('0',///,15X,'CAMPUS',35X,'STUDENT LEVEL',/,31X,'GRADUATE',  0394
     17X,'ASSOCOATE',6X,'L D BACC',7X,'U D BACC',8X,'ADJUNCT',14X,'TOTAL  0396
     2')                                                                  0398
  156 FORMAT ('0',7X,'PSU TOTALS',6X,5(9X,I6),13X,I8)                     0400
  158 FORMAT ('+',20X,46('_'))                                            0402
  160 FORMAT ('0',20X,16A1,5X,6(I6,4X),////)                              0404
  162 FORMAT ('3',15X,'MISSING ENROLLMENT SECTION FOR MATRIX:',//,26X,'C  0406
     1AMPUS=',18X,16A1,/,26X,'STUDENT LEVEL=',11X,16A1,/,26X,'COLLEGE OF  0408
     2 ENROLLMENT=',3X,16A1)                                              0410
  164 FORMAT ('1')                                                        0412
  166 FORMAT ('2')                                                        0414
  168 FORMAT ('1',20X,10A8)                                               0416
      REAL*8 HEADER(10)                                                   0418
      INTEGER*4 UDEPT(5,15,22,5),CDEPT(15,22,8)
      INTEGER*4 UCBC(5,16,16,6)                                           0422
      INTEGER*4 CAP(4,5),IND(5),COLL(16),CBC(13,5),TOTD(13,6),TOTA(19),N  0424
     1DEP(15),ACOL(5,21,13),TOAC(13,21),NZPTR(14),ICT(6),IAUT(6)
      INTEGER*4 HEGIS(140)                                                0428
      REAL*4 GTOTAL(6)                                                    0430
      REAL*4 SCOL(5,21)                                                   0432
      REAL*4 SUBCAT(30,2)                                                 0434
      LOGICAL*1 CAMP(22,16),STLEV(5,16),DEP(141,26),BUFF(26)              0436
      COMMON ACOL,UDEPT,CDEPT,SUBCAT,TOTD,COLL,HEGIS,DEP,CAMP
      DATA NDEP/13,8,8,9,14,1,6,21,14,7,10,4,1,0,4/                       0440
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC  0442
C                                                                         0444
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C        HERE WE DO ALL OF THE TABLE PRINTING                                0448                    06-12-73
C        TABLES ARE USED FOR OUTPUT.  INITIALIZATION IS DONE EACH TIME       0450
C        A SET OF MATRICES IS OUTPUT.                                        0452
C                                                                            0454
C        WE FIRST OF ALL READ IN THE CAMPUS NAMES AND STUDENT LEVELS.        0456
C        THEN THE VARIOUS DEPARTMENT S UNDER EACH COLLEGE ARE PUT INTO       0458
C        AN ARRAY FOR PRINTING.                                              0460
C                                                                            0462
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC 0464
      READ (5,170) HEADER
170    FORMAT(10A8)                                                          0468
      WRITE (9,168) HEADER                                                   0470
COMMENT: INITIALIZE HEGIS SUBCATAGORIES.                                     0472
      DO 172  I=1,30                                                         0474
      DO 172  J=1,2                                                          0476
  172 SUBCAT(I,J)=0.0                                                        0478
COMMENT: INITIALIZE UNIVERSITY GRAND TOTALS BY COLLEGE OF ENROLLMENT         0480
      DO 174  I=1,5                                                          0482
      DO 174  J=1,16                                                         0484
      DO 174  K=1,16                                                         0486
      DO 174  L=1,6                                                          0488
  174 UCBC(I,J,K,L)=0                                                        0490
COMMENT: INITIALIZE UNIVERSITY TOTALS OF DEPARTMENTAL CREDIT LOADS.          0492
      DO 176  I=1,5                                                          0494
      DO 176  J=1,15                                                         0496
      DO 176  K=1,22                                                         0498
      DO 176  L=1,5                                                          0500
  176 UDEPT(I,J,K,L)=0
      DO 187 J=1,15
      DO 187 K=1,22
      DO 187 L=1,8
187   CDEPT(J,K,L)=0
      WRITE (9,154)                                                          0502
COMMENT: READ CAMPUS NAMES.                                                  0504
      DO 178  I=1,22                                                         0506
COMMENT: READ STUDENT LEVEL NAMES.                                           0508
  178 READ (5,100) (CAMP(I,J),J=1,16)                                        0510
      DO 180  I=1,5                                                          0512
      ICT(I)=0                                                               0514
      IAUT(I)=0                                                              0516
  180 READ (5,100) (STLEV(I,J),J=1,16)                                       0518
      IAUT(6)=0                                                              0520
      ICT(6)=0                                                               0522
      NCT=0                                                                  0524
      M=1                                                                    0526
      ICOL=1                                                                 0528
      IPTR=2                                                                 0530
  182 I=0                                                                    0532
      GO TO 186                                                              0534
  184 I=J                                                                    0536
  186 IF (NCT.EQ.140) GO TO 196                                              0538
      READ (5,146,END=196) J,(BUFF(L),L=1,24),ICODE                          0540
      NCT=NCT+1                                                              0542
      IF (I.EQ.J) GO TO 192                                                  0544
      DO 188  L=1,24                                                         0546
  188 DEP(IPTR,L)=BUFF(L)                                                    0548
      HEGIS(IPTR)=ICODE                                                      0550
      WRITE (6,190) NCT,(DEP(IPTR,L),L=1,24),HEGIS(IPTR)                     0552
  190 FORMAT (' ',I3,5X,24A1,5X,'HEGIS CODE =',I3)                           0554
      IPTR=IPTR+1                                                            0556
```

```
      GO TO 181
  192 DO 194  L=1,24                                                    0560                    06-12-73
  194 DEP(ICOL,L)=BUFF(L)                                               0562
      WRITE (6,190) NCT,(DEP(ICOL,L),L=1,24),ICODE                      0564
      COLL(M)=ICOL                                                      0566
      ICOL=IPTR                                                         0568
      IPTR=IPTR+1                                                       0570
      M=M+1                                                             0572
      GO TO 182                                                         0574
C                                                                       0576
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC 0578
C                                                                       0580
C        SWITCHES ARE SET AS FOLLOWS:                                   0582
C             IS1 ===>  THIS IS TURNTED ON AUTOMATICALLY WHEN THE       0584
C                       END OF THE INPUT FILE CONTAINING THE ENROLLMENT  0586
C                       IS REACHED.  THIS INDICATES THAT ALL FINAL       0588
C                       PRINTING AND BOOKEEPING SHOULD BE DONE AND       0590
C                       THE PROGRAM TERMINATED.                          0592
C                                                                       0594
C             IS2 ===>  THIS SWITCH IS TURNED ON WHEN IT IS UNNECESSARY  0596
C                       TO READ IN A SECTION OF THE ENROLLMENT MODEL      0598
C                       WITH A MATRIX OF COFFICIENTS.                    0600
C                                                                       0602
C             ISN ===>  THIS SWITCH IS READ IN FROM THE CARD READER AND  0604
C                       IF ON, SUPRESSES THE PRINTING OF A PROTION OF    0606
C                       THE OUTPUT.                                      0608
C                                                                       0610
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC 0612
C                                                                       0614
  196 IS1=0                                                             0616
      IS2=0                                                             0618
      READ (5,102) ISN                                                  0620
      READ (11) (IND(L),L=1,5)                                          0622
      NU=NDEP(IND(4))                                                   0624
      READ (11) ((SCOL(K,L),K=1,5),L=1,NU)                              0626
      READ (10,102) JYR,JCAM,JCE,JSL,SCH                               0628
C                                                                       0630
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC 0632
C                                                                       0634
C        THIS INITIALIZATION IS DONE ONLY WHEN WE START TO PROCESS A     0636
C        NEW CAMPUS OR STUDENT LEVEL.                                   0638
C                                                                       0640
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC 0642
C                                                                       0644
  198 DO 200  I=1,13                                                    0646
      DO 200  J=1,21                                                    0648
      TOAC(I,J)=0                                                       0650
      DO 200  K=1,5                                                     0652
  200 ACOL(K,J,I)=0                                                     0654
      DO 202  K=1,5                                                     0656
      DO 202  J=1,4                                                     0658
  202 CAP(J,K)=0                                                        0660
      DO 204  K=1,13                                                    0662
      DO 204  L=1,6                                                     0664
  204 TOTD(K,L)=0                                                       0666
C                                                                       0668
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC 0670
C                                                                       0672
C        THIS INITIALIZATION IS DONE EACH TIME A NEW COLLEGE OF         0674
C        ENROLLMENT IS ENCOUNTERED.                                     0676
```

```
C                                                                               0680                    06-12-73
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC   0682
C                                                                               0684
  206 DO 208  J=1,13                                                            0686
      DO 208  K=1,5                                                             0688
  208 CRC(J,K)=0                                                                0690
      DO 210  J=1,19                                                            0692
  210 TOTA(J)=0                                                                 0694
C                                                                               0696
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC   0698
C                                                                               0700
C         A MATRIX OF COFFICIENTS AND A SECTION OF THE ENROLLMENT MODEL         0702
C         ARE ACCESSED AND CHECKED FOR A MATCH.  IF THEY DO NOT MATCH,          0704
C         A MESSAGE IS PRINTED AND WE CONTINUE WITH A NEW PAIR.                 0706
C                                                                               0708
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC   0710
C                                                                               0712
COMMENT: CHECK FOR STUDENT LEVEL, CAMPUS, OR COLLEGE OF ENROLLMENT CHANG        0714
      IF ((JCAM.EQ.IND(1)).AND.(JSL.EQ.IND(2)).AND.(JCE.EQ.IND(3))) GO T        0716
     1O 230                                                                     0718
      GO TO 218                                                                 0720
  212 IF (IS2.EQ.1) GO TO 214                                                   0722
      READ (10,102,END=236) JYR,JCAM,JCE,JSL,SCH                                0724
      IS2=1                                                                     0726
  214 READ (11,END=212) (IND(L),L=1,5)                                          0728
      NU=NDEP(IND(4))                                                           0730
      READ (11) ((SCOL(K,L),K=1,5),L=1,NU)                                      0732
      IF (IS2.EQ.1) GO TO 218                                                   0734
  216 READ (10,102,END=236) JYR,JCAM,JCE,JSL,SCH                                0736
  218 IS2=0                                                                     0738
      IF ((JCAM.EQ.IND(1)).AND.(JSL.EQ.IND(2)).AND.(JCE.EQ.IND(3))) GO T        0740
     1O 228                                                                     0742
      IF (JCAM.GT.IND(1)) GO TO 222                                             0744
      IF (JCAM.LT.IND(1)) GO TO 220                                             0746
      IF (JSL.GT.IND(2)) GO TO 222                                              0748
      IF (JSL.LT.IND(2)) GO TO 220                                              0750
      IF (JCE.GT.IND(3)) GO TO 222                                              0752
  220 WRITE (8,106) (CAMP(JCAM,L),L=1,16),(STLEV(JSL,L),L=1,16),(DEP(COL        0754
     1L(JCE),L),L=1,16)                                                         0756
      GO TO 216                                                                 0758
  222 WRITE (8,162) (CAMP(IND(1),L),L=1,16),(STLEV(IND(2),L),L=1,16),(DE        0760
     1P(COLL(IND(3)),L),L=1,16)                                                 0762
  224 IF (IND(5).EQ.999) GO TO 226                                              0764
      READ (11) (IND(L),L=1,5)                                                  0766
      NU=NDEP(IND(4))                                                           0768
      READ (11) ((SCOL(K,L),K=1,5),L=1,NU)                                      0770
      GO TO 224                                                                 0772
  226 IS2=1                                                                     0774
      GO TO 214                                                                 0776
C                                                                               0778
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC   0780
C                                                                               0782
C         WHEN A MATCH OCCURS, WE FIRST SEE IF OUTPUT IS NECESSARY.             0784
C         IF NOT, CREDITS ARE ADDED TO SUMS .  IF WE ARE AT THE END OF          0786
C         SET OF COFFICIENT MATRICES, WE GO GET A NEW PAIR.  IF NOT             0788
C         WE GET ONLY A NEW MATRIX OF COFFICIENTS.                              0790
C                                                                               0792
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC   0794
C                                                                               0796
  228 IF (TOTA(19).EQ.0) GO TO 230
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     138                                                                    0800                    06-12-73
  230 NU=NDEP(IND(4))                                                       0802
      DO 234  J=1,NU                                                        0804
      DO 234  K=1,5                                                         0806
      ISC=(SCOL(K,J)*SCH)+0.5                                               0808
COMMENT: ADD TO TOTAL UNIVERSITY CREDITS BY STUDENT LEVEL TABLE.            0810
      IAUT(IND(2))=IAUT(IND(2))+ISC                                         0812
      IAUT(6)=IAUT(6)+ISC                                                   0814
      ICT(IND(2))=ICT(IND(2))+ISC                                           0816
      ICT(6)=ICT(6)+ISC                                                     0818
      IF (IND(1).EQ.6) GO TO 232                                            0820
      ACOL(K,J,IND(4))=ACOL(K,J,IND(4))+ISC                                 0822
      TOTD(IND(4),K)=TOTD(IND(4),K)+ISC                                     0824
      TOTD(IND(4),6)=TOTD(IND(4),6)+ISC                                     0826
      TOAC(IND(4),J)=TOAC(IND(4),J)+ISC                                     0828
      TOTA(IND(4))=TOTA(IND(4))+ISC                                         0830
      TOTA(13+K)=TOTA(13+K)+ISC                                             0832
      TOTA(19)=TOTA(19)+ISC                                                 0834
      CBC(IND(4),K)=CBC(IND(4),K)+ISC                                       0836
      GO TO 234                                                             0838
COMMENT: THIS IS THE SPECIAL CAPITOL CAMPUS SECTION.                        0840
  232 CAP(J,K)=CAP(J,K)+ISC                                                 0842
      TOTA(K)=TOTA(K)+ISC                                                   0844
      TOTA(6)=TOTA(6)+ISC                                                   0846
      TOTD(1,K)=TOTD(1,K)+ISC                                               0848
      TOTD(1,6)=TOTD(1,6)+ISC                                               0850
      TOAC(1,J)=TOAC(1,J)+ISC                                               0852
      TOTA(19)=TOTA(19)+ISC                                                 0854
COMMENT: ADD TO TOTAL UNIVERSITY CREDITS BY STUDENT LEVEL TABLE.            0856
  234 CONTINUE                                                              0858
      ICA=IND(1)                                                            0860
      ISL=IND(2)                                                            0862
      ICE=IND(3)                                                            0864
      IF (IND(5).NE.999) IS2=1                                              0866
      GO TO 214                                                             0868
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC  0870
C                                                                           0872
C         THIS SECTION DEALS WITH OUTPUT OS INFORMATION TO THE PRINTER.     0874
C                                                                           0876
C         FOR EACH COLLEGE OF ENROLLMENT, PRINT THE CORRESPONDING           0878
C         TABLE WHICH HAS ALL THE CREDITS TAKEN BY STUDENTS IN THIS         0880
C         COLLEGE OF ENROLLMENT.  THE CREDITS ARE GIVEN BY COURSE LEVEL     0882
C         AND BY THE COLLEGE IN WHICH THE COURSE WAS TAKEN.                 0884
C         A SPECIAL CASE IS CONSIDERED FOR CAPITOL CAMPUS.                  0886
C                                                                           0888
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC  0890
C                                                                           0892
  236 IS1=1                                                                 0894
  238 IY=JYR+1971
      WRITE (6,128) (CAMP(ICA,L),L=1,16),(STLEV(ISL,L),L=1,16),IY           0898
      WRITE (6,124) (DEP(COLL(ICE),L),L=1,16)                               0900
      WRITE (6,130)                                                         0902
COMMENT: CHECK FOR CAPITOL PROGRAM.                                         0904
      IF (ICA.NE.6) GO TO 242                                               0906
COMMENT: OUTPUT SECTION FOR CAPITOL CAMPUS.                                 0908
      WRITE (6,160) (DEP(COLL(15),L),L=1,16),(TOTA(J),J=1,6)                0910
COMMENT: ADD CAMPUS TOTALS BY COLLEGE OF ENROLLMENT TO UNIVERSITY           0912
C              GRAND TOTALS.                                                0914
      DO 240  J=1,6                                                         0916
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  240 UCBC(ISL,ICE,16,J)=UCBC(ISL,ICE,16,J)+TOTA(J)                          0920
      GO TO 252                                                             0922
  242 DO 244  J=1,13                                                        0924
      IF (TOTA(J).EQ.0) GO TO 244                                           0926
      WRITE (6,126) (DEP(COLL(J),L),L=1,16),(CBC(J,K),K=1,5),TOTA(J)        0928
COMMENT: OUTPUT SECTION FOR ALL CAMPUSES EXCEPT CAPITOL.                    0930
  244 CONTINUE                                                              0932
      WRITE (6,142) (TOTA(13+J),J=1,6)                                      0934
COMMENT: ADD CAMPUS TOTALS BY COLLEGE OF ENROLLMENT TO UNIVERSITY           0936
C              GRAND TOTALS.                                                0938
C                                                                           0940
      DO 248  J=1,13                                                        0942
      DO 246  K=1,5                                                         0944
  246 UCBC(ISL,ICE,J,K)=UCBC(ISL,ICE,J,K)+CBC(J,K)                          0946
  248 UCBC(ISL,ICE,J,6)=UCBC(ISL,ICE,J,6)+TOTA(J)                           0948
C                                                                           0950
COMMENT: ADD CAMPUS GRAND TOTALS BY COLLEGE OF ENROLLMENT TO                0952
C              UNIVERSITY GRAND TOTALS.                                     0954
C                                                                           0956
      DO 250  J=1,6                                                         0958
  250 UCBC(ISL,ICE,16,J)=UCBC(ISL,ICE,16,J)+TOTA(J+13)                      0960
C                                                                           0962
C                                                                           0964
  252 IF ((ISN.EQ.1).AND.(IS1.EQ.0)) GO TO 198                              0966
      IF (ISN.EQ.1) GO TO 290                                               0968
      IF ((ISL.EQ.IND(2)).AND.(ICA.EQ.IND(1)).AND.(IS1.EQ.0)) GO TO 206     0970
C                                                                           0972
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC  0974
C                                                                           0976
C        CAMPUS OF STUDENT LEVEL CHANGES OR THE END OF THE INPUT FILE       0978
C        IS REACHED, WE OUTPUT THIS INFORMATION.                            0980
C        HERE WE PRINT AGAIN A SERIES OF THIRTEEN TABLES BUT THESE          0982
C        ARE FOR ALL COLLEGES OF ENROLLMENT AT THIS PARTICULAR STUDENT      0984
C        LEVEL.                                                             0986
C                                                                           0988
C        WE FIRST OF ALL BUILD A LIST OF POINTERS INDICATING WHICH          0990
C        TABLES ARE NONZERO.  A MARKER IS USED TO DESIGNATE THE END OF      0992
C        THE LIST.                                                          0994
C                                                                           0996
C        CAPITOL CAMPUS IS OUTPUT AS A SPECIAL CASE.                        0998
C                                                                           1000
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC  1002
C                                                                           1004
      I=1                                                                   1006
      L1=1                                                                  1008
      DO 254  J=1,13                                                        1010
      IF (TOTD(J,6).EQ.0) GO TO 254                                         1012
      NZPTR(L1)=J                                                           1014
      L1=L1+1                                                               1016
  254 CONTINUE                                                              1018
      NZPTR(L1)=999                                                         1020
      WRITE (6,104) (CAMP(ICA,L),L=1,16)                                    1022
      WRITE (6,108) (STLEV(ISL,L),L=1,16)                                   1024
      LNCT=5                                                                1026
COMMENT: CHECK FOR CAPITOL PROGRAM.                                         1028
      IF (ICA.NE.6) GO TO 260                                               1030
COMMENT: OUTPUT SECTION FOR CAPITOL CAMPUS.                                 1032
      WRITE (6,136)                                                         1034
      DO 256  J=1,4                                                         1036
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      WRITE (6,116) (DEP(COLL(15)+J,L),L=1,16),(CAP(J,K),K=1,5)                 1040                    06-12-73
COMMENT: ADD CAPITOL CAMPUS TO HEGIS SUBCATAGORIES.                             1148
      M=2                                                                       1150
      IF (ISL.EQ.1) M=1                                                         1152
      DO 253 K=1,5
      UDEPT(ISL,15,J,K)=UDEPT(ISL,15,J,K)+CAP(J,K)                              1156
      CDEPT(15,J,K)=CDEPT(15,J,K)+CAP(J,K)
      IF(ISL.EQ.1)CDEPT(15,J,8)=CDEPT(15,J,8)+CAP(J,K)
      IF(ISL.EQ.4)CDEPT(15,J,7)=CDEPT(15,J,7)+CAP(J,K)
      IF(ISL.EQ.2.OR.ISL.EQ.3.OR.ISL.EQ.5)CDEPT(15,J,6)=CDEPT(15,J,6)+
     *CAP(J,K)
253   SUBCAT(HEGIS(COLL(15)+J),M)=SUBCAT(HEGIS(COLL(15)+J),M)+CAP(J,K)
  256 CONTINUE                                                                  1042
      WRITE (6,158)                                                             1044
      WRITE (6,138) (TOTD(1,J),J=1,6)                                           1046
      GO TO 290                                                                 1048
C                                                                               1050
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC 1052
C                                                                               1054
C        STARTING AT LABEL 111, WE ENTER A LOOP FROM LABEL 10 TO LABEL          1056
C        448 WHICH PRINTS THOSE NONZERO TABLES POINTED TO BY OUR LIST           1058
C        OF POINTERS.  THE TABLES ARE PRINTED SIDE BY SIDE TO REDUCE            1060
C        THE AMOUNT OF PAPER NEEDED.  THE LOOP IS SOMEWHAT INVOLVED             1062
C        SINCE WE PRINT NO ZERO TABLES OR ROWS.  THIS MEANS THAT WE             1064
C        MUST LOCATE TWO NONZERO ROWS BEFORE PRINTING.                          1066
C                                                                               1068
C        A LINE COUNT IS KEPT TO AVOID PRINTING ONE TABLE ON TWO PAGES.         1070
C                                                                               1072
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC 1074
C                                                                               1076
  258 WRITE (6,134)                                                             1078
      WRITE (6,122) (TOTD(NZPTR(I-2),K),K=1,5),(TOTD(NZPTR(I-1),K),K=1,5
     1)                                                                         1080
      WRITE (6,132) TOTD(NZPTR(I-2),6),TOTD(NZPTR(I-1),6)                       1082
  260 IF (NZPTR(I).EQ.999) GO TO 290                                            1084
      IF (NZPTR(I+1).NE.999) GO TO 266                                          1086
      IF (LNCT+16+NDEP(NZPTR(I)).LE.60) GO TO 262                               1088
      WRITE (6,164)                                                             1090
      LNCT=0                                                                    1092
  262 WRITE (6,140) (DEP(COLL(NZPTR(I)),L),L=1,16)                              1094
      LNCT=LNCT+16                                                              1096
      MA1=NDEP(NZPTR(I))                                                        1098
      DO 264  J=1,MA1                                                           1100
      IF (TOAC(NZPTR(I),J).EQ.0) GO TO 264                                      1102
      WRITE (6,116) (DEP(COLL(NZPTR(I))+J,L),L=1,16),(ACOL(K,J,NZPTR(I))        1104
     1,K=1,5)                                                                   1106
      CALL BABE (NZPTR(I),J,ISL)                                                1108
      LNCT=LNCT+1                                                               1110
  264 CONTINUE                                                                  1112
      WRITE (6,144) (TOTD(NZPTR(I),K),K=1,6)                                    1114
      GO TO 290                                                                 1116
  266 IF (LNCT+16+MAXO(NDEP(NZPTR(I)),NDEP(NZPTR(I+1))).LE.60) GO TO 268        1118
      WRITE (6,164)                                                             1120
      LNCT=0                                                                    1122
  268 WRITE (6,110) (DEP(COLL(NZPTR(I)),L),L=1,16),(DEP(COLL(NZPTR(I+1))        1124
     1,L),L=1,16)                                                               1126
      WRITE (6,112)                                                             1128
      WRITE (6,120)                                                             1130
      LNCT=LNCT+16                                                              1132
                                                                                1134
```

```
      ND2=NDEP(NZPTR(I+1))                                                    1138                    06-12-73
      IW1=1                                                                   1140
      IW2=1                                                                   1142
  270 IF (IW1.EQ.999) GO TO 276                                               1144
      DO 272  J=IW1,ND1                                                       1146
      IF (TOAC(NZPTR(I),J).NE.0) GO TO 274                                    1148
  272 CONTINUE                                                                1150
      IW1=999                                                                 1152
      GO TO 276                                                               1154
  274 IW1=J+1                                                                 1156
  276 IF (IW2.EQ.999) GO TO 282                                               1158
      DO 278  J=IW2,ND2                                                       1160
      IF (TOAC(NZPTR(I+1),J).NE.0) GO TO 280                                  1162
  278 CONTINUE                                                                1164
      IW2=999                                                                 1166
      GO TO 282                                                               1168
  280 IW2=J+1                                                                 1170
  282 IF ((IW1.EQ.999).AND.(IW2.EQ.999)) GO TO 288                            1172
      IF (IW1.EQ.999) GO TO 284                                               1174
      IF (IW2.EQ.999) GO TO 286                                               1176
      WRITE (6,114) (DEP(COLL(NZPTR(I))+IW1-1,L),L=1,16),(ACOL(K,IW1-1,N      1178
     1ZPTR(I)),K=1,5),(DEP(COLL(NZPTR(I+1))+IW2-1,L),L=1,16),(ACOL(K,IW2      1180
     2-1,NZPTR(I+1)),K=1,5)                                                   1182
      J=IW1-1                                                                 1184
      CALL BABE (NZPTR(I),J,ISL)                                              1186
      J=IW2-1                                                                 1188
      CALL BABE (NZPTR(I+1),J,ISL)                                            1190
      LNCT=LNCT+1                                                             1192
      GO TO 270                                                               1194
  284 WRITE (6,118) (DEP(COLL(NZPTR(I+1))+IW2-1,L),L=1,16),(ACOL(K,IW2-1      1196
     1,NZPTR(I+1)),K=1,5)                                                     1198
      J=IW2-1                                                                 1200
      CALL BABE (NZPTR(I+1),J,ISL)                                            1202
      LNCT=LNCT+1                                                             1204
      GO TO 276                                                               1206
  286 WRITE (6,116) (DEP(COLL(NZPTR(I))+IW1-1,L),L=1,16),(ACOL(K,IW1-1,N      1208
     1ZPTR(I)),K=1,5)                                                         1210
      J=IW1-1                                                                 1212
      LNCT=LNCT+1                                                             1214
      CALL BABE (NZPTR(I),J,ISL)                                              1216
      GO TO 270                                                               1218
  288 I=I+2                                                                   1220
      IF(I.GT.13)GO TO 290
      GO TO 258                                                               1222
C                                                                             1224
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC 1226
C        AFTER PRINTING, CHECK TO SEE IF A NEW CAMPUS HAS BEEN                1228
C        ENCOUNTERED.  IF SO, OPEN A NEW FILE ON THE TAPE.  IF ALL            1230
C        RECORDS HAVE BEEN PROCESSED, PRINT THE NUMBER OF CREDITS             1232
C        PROCESSED IN THE RUN AND STOP.  OTHERSISE, RETURN TO THE             1234
C        INITIALIZATION PORTION.                                              1236
C                                                                             1238
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC 1240
C                                                                             1242
  290 IF (LNCT.LT.30) WRITE (6,166)                                           1244
      IF ((ISI.EQ.0).AND.(ICA.EQ.IND(1))) GO TO 198                           1246
      IF (ICA.EQ.IND(1)) GO TO 296                                            1248
      WRITE (9,292) (CAMP(ICA,L),L=1,16),(ICT(L),L=1,6)                       1250
  292 FORMAT ('0',7X,16A1,5(9X,I6),13X,I8)                                    1252
```

```
  294 ICT(I)=0                                                          1256          06-12-74
C        OUTPUT SECTION FOR PBP.
      CALL PBP(ICA,NDEP)
  296 CONTINUE                                                          1258
      IF (ISL.EQ.0) GO TO 198                                           1260
      WRITE (6,148)                                                     1262
      M=1                                                               1264
  298 WRITE (6,150) (DEP(COLL(M),L),L=1,16)                             1266
      J=COLL(M+1)-COLL(M)-1                                             1268
      DO 300  K=1,J                                                     1270
  300 WRITE (6,152) (DEP(COLL(M)+K,L),L=1,26)                           1272
      M=M+1                                                             1274
      IF (M.LT.14) GO TO 298                                            1276
      CONTINUE                                                          1278
      CALL PBP(22,NDEP)
      WRITE (9,292) (CAMP(ICA,L),L=1,16),(ICT(L),L=1,6)                 1280
      WRITE (9,156) (IAUT(L),L=1,6)                                     1282
      WRITE (6,168) HEADER                                              1284
      WRITE (6,302)                                                     1286
  302 FORMAT ('0HEGIS CODE',T20,'GRAD CREDITS',T40,'UNDERGRAD CREDITS',T 1288
     160,'TOTAL CREDITS',T80,'   GRAD FTE',T100,'UNDERGRAD FTE',T120,'TO 1290
     2TAL FTE')                                                         1292
      DO 304  I=1,6                                                     1294
  304 GTOTAL(I)=0.0                                                     1296
      DO 310  I=1,30                                                    1298
      XTOTAL=SUBCAT(I,1)+SUBCAT(I,2)                                    1300
      XGRAD=SUBCAT(I,1)/24.0                                            1302
      XUGRAD=SUBCAT(I,2)/30.0                                           1304
      XFTE=XGRAD+XUGRAD                                                 1306
      GTOTAL(1)=GTOTAL(1)+SUBCAT(I,1)                                   1308
      GTOTAL(2)=GTOTAL(2)+SUBCAT(I,2)                                   1310
      GTOTAL(3)=GTOTAL(3)+XTOTAL                                        1312
      GTOTAL(4)=GTOTAL(4)+XGRAD                                         1314
      GTOTAL(5)=GTOTAL(5)+XUGRAD                                        1316
      GTOTAL(6)=GTOTAL(6)+XFTE                                          1318
      IF (I.GT.23) GO TO 308                                            1320
      WRITE (6,306) I,SUBCAT(I,1),SUBCAT(I,2),XTOTAL,XGRAD,XUGRAD,XFTE  1322
  306 FORMAT ('0',I5,T20,F10.2,T40,F10.2,T60,F10.2,T80,F10.2,T100,F10.2, 1324
     1T120,F10.2)                                                       1326
      GO TO 310                                                         1328
  308 IF (I.EQ.24) WRITE (6,168) HEADER                                 1330
      IF (I.EQ.24) WRITE (6,302)                                        1332
      J=I+25                                                            1334
      WRITE (6,306) J,SUBCAT(I,1),SUBCAT(I,2),XTOTAL,XGRAD,XUGRAD,XFTE  1336
  310 CONTINUE                                                          1338
      WRITE (6,312) GTOTAL                                              1340
  312 FORMAT (//,' UNIVERSITY TOTALS:',T20,F10.2,T40,F10.2,T60,F10.2,T80 1342
     1,F10.2,T100,F10.2,T120,F10.2)                                     1344
C                                                                       1346
C                                                                       1348
COMMENT: UNIVERSIT GRAND TOTALS BY COLLEGE OF ENROLLMENT OUTPUT SECTION. 1350
C                                                                       1352
C                                                                       1354
      DO 320  ISL=1,5                                                   1356
      DO 318  ICE=1,16                                                  1358
COMMENT: SKIP, IF GRAND TOTAL EQUALS ZERO.                              1360
      IF (UCBC(ISL,ICE,16,6).EQ.0) GO TO 318                            1362
      WRITE (9,314) (STLEV(ISL,L),L=1,16)                               1364
  314 FORMAT ('2',20X,'UNIVERSITY TOTALS=',14X,16A1)                    1366
```

```
      WRITE (9,130)                                                          1370
      DO 316  K=1,15                                                         1372
      IF (UCBC(ISL,ICE,K,6).EQ.0) GO TO 316                                  1374
      WRITE (9,126) (DEP(COLL(K),L),L=1,16),(UCBC(ISL,ICE,K,J),J=1,6)        1376
  316 CONTINUE                                                               1378
      WRITE (9,142) (UCBC(ISL,ICE,16,J),J=1,6)                               1380
  318 CONTINUE                                                               1382
  320 CONTINUE                                                               1384
C                                                                            1386
C                                                                            1388
COMMENT: UNIVERSITY GRAND TOTALS OF CREDIT LOADS ON DEPARTMENTS              1390
C              OUTPUT SECTION.                                               1392
C                                                                            1394
      DO 330  ISL=1,5                                                        1396
      DO 330  JCT=1,15                                                       1398
      WRITE (6,322) (STLEV(ISL,L),L=1,16)                                    1400
  322 FORMAT ('1',20X,'UNIVERSITY TOTALS=',14X,16A1)                         1402
COMMENT: SKIP, IF GRAND TOTAL EQUALS ZERO.                                   1404
      WRITE (6,140) (DEP(COLL(JCT),L),L=1,16)                                1406
      NU=NDEP(JCT)                                                           1408
      DO 324  L=1,NU                                                         1410
  324 WRITE (6,116) (DEP(COLL(JCT)+L,K),K=1,16),(UDEPT(ISL,JCT,L,K),K=1,     1412
     15)                                                                     1414
      DO 326  L=1,NU                                                         1416
      DO 326  K=1,5                                                          1418
      UDEPT(ISL,JCT,22,K)=UDEPT(ISL,JCT,22,K)+UDEPT(ISL,JCT,L,K)             1420
  326 CONTINUE                                                               1422
      I=0                                                                    1424
      DO 328  K=1,5                                                          1426
  328 I=I+UDEPT(ISL,JCT,22,K)                                                1428
      WRITE (6,144) (UDEPT(ISL,JCT,22,K),K=1,5),I                            1430
  330 CONTINUE                                                               1432
C                                                                            1434
      STOP                                                                   1436
      END                                                                    1438
C     FIFTED 11/20/72 -- FIFT * VERSION 2.12 *                               1440
      SUBROUTINE BABE (IPTR,J,JSL)                                           1442
      REAL*4 SUBCAT(30,2)                                                    1444
      INTEGER*4 UDEPT(5,15,22,5),CDEPT(15,22,8),TOTD(13,6)
      INTEGER*4 ACOL(5,21,13),HEGIS(140),COLL(16)                            1448
      INTEGER*4 I800(24)                                                     1450
      LOGICAL*1 CAMP(22,16),DEP(141,26)
      COMMON ACOL,UDEPT,CDEPT,SUBCAT,TOTD,COLL,HEGIS,DEP,CAMP
      DATA I800/54,53,50,54,50,50,51,55,53,50,50,52,50,55,50,55,53,18,53     1454
     1,55,55,55,55,50/                                                       1456
C                                                                            1458
C                                                                            1460
COMMENT: THIS SUBROUTINE ADDS CREDITS TO BOTH THE HEGIS SUBCATAGORIES        1462
C              AND TO THE CREDIT LOAD ON DEPARTMENTS TOTALS.                 1464
C                                                                            1466
C                                                                            1468
      ISL=JSL                                                                1470
      ITEMP=HEGIS(COLL(IPTR)+J)                                              1472
      IF (ITEMP.GT.23) ITEMP=ITEMP-25                                        1474
      M=2                                                                    1476
      IF (JSL.EQ.1) M=1                                                      1478
      DO 102  K=1,5                                                          1480
      IF (K.LT.5.OR.ACOL(K,J,IPTR).EQ.0) GO TO 100                           1482
      ITEMP=I800(ITEMP)                                                      1484
```

```
  100 CONTINUE                                                          1488                    06-12-73
      SUBCAT(ITEMP,M)=SUBCAT(ITEMP,M)+ACOL(K,J,IPTR)                    1490
  102 CONTINUE                                                          1492
      DO 104  K=1,5                                                     1494
      CDEPT(IPTR,J,K)=CDEPT(IPTR,J,K)+ACOL(K,J,IPTR)
      IF(ISL.EQ.2.OR.ISL.EQ.3.OR.ISL.EQ.5)CDEPT(IPTR,J,6)=CDEPT(IPTR,J,6
     1)+ACOL(K,J,IPTR)
      IF(ISL.EQ.4)CDEPT(IPTR,J,7)=CDEPT(IPTR,J,7)+ACOL(K,J,IPTR)
      IF(ISL.EQ.1)CDEPT(IPTR,J,8)=CDEPT(IPTR,J,8)+ACOL(K,J,IPTR)
  104 UDEPT(ISL,IPTR,J,K)=UDEPT(ISL,IPTR,J,K)+ACOL(K,J,IPTR)            1496
      RETURN                                                            1498
      END                                                               1500
      SUBROUTINE PRP(ICA,NDEP)
      REAL*4 SUBCAT(30,2)                                               1542
      INTEGER*4 UDEPT(5,15,22,5),TOTD(13,6)                             1544
      INTEGER*4 CDEPT(15,22,8),NDEP(15)
      INTEGER*4 ACOL(5,21,13),MEGIS(140),COLL(16)                       1546
      LOGICAL*1 CAMP(22,16),DEP(141,26)
      COMMON ACOL,UDEPT,CDEPT,SUBCAT,TOTD,COLL,MEGIS,DEP,CAMP
      N=13
      M=20
      WRITE(N,412) (CAMP(ICA,L),L=1,16)
  412 FORMAT('1',20X,'CAMPUS=',12X,16A1,/,21X,'TOTALS BY DEPARTMENT')
      DO 400 JCT=1,15
      NU=NDEP(JCT)
      DO 406 L=1,NU
      DO 406 K=1,8
      CDEPT(JCT,22,K)=CDEPT(JCT,22,K)+CDEPT(JCT,L,K)
  406 CONTINUE
      I=0
      DO 408 K=1,5
  408 I=I+CDEPT(JCT,22,K)
      IF(I.EQ.0)GO TO 400
      WRITE(N,414)(DEP(COLL(JCT),L),L=1,16)
      WRITE(M,420)(CAMP(ICA,L),L=1,16),(DEP(COLL(JCT),L),L=1,16),NU,
     *(CDEPT(JCT,22,K),K=1,8),I
  420 FORMAT(' ',32A1,I2,9I6)
  414 FORMAT('2',10X,'CREDITS TAKEN IN COLLEGE OF ',16A1,//,8X,' DEPT',
     132X,'COURSE LEVEL',25X,'STUDENT LEVEL',//,30X,' 0 -399  400-499  5
     200-599  600-699  800-899  |  LD DIV   UP DIV   GR DIV')
      DO 402 L=1,NU
      WRITE(M,425)(DEP(COLL(JCT)+L,K),K=1,24),(CDEPT(JCT,L,K),K=1,8)
  425 FORMAT(' ',24A1,8I6)
  402 WRITE(N,404) (DEP(COLL(JCT)+L,K),K=1,24),(CDEPT(JCT,L,K),K=1,8)
  404 FORMAT(' ',2X,24A1,2X,5(I6,3X),' |',3(I6,3X))
      WRITE(N,416) (CDEPT(JCT,22,K),K=1,8),I
  416 FORMAT('+',102('_'),/,10X,' TOTALS',12X,5(I6,3X),' |',3(I6,3X),
     1/,10X,' GRAND TOTAL',7X,I6)
  400 CONTINUE
      DO 410 J=1,15
      DO 410 K=1,22
      DO 410 L=1,8
  410 CDEPT(J,K,L)=0
      RETURN
      END
/*
//DATA.FT10F001 DD DSN=YTHR,UNIT=2400,VOL=SER=BMT18,LABEL=(3,SL),
//   DCB=(RECFM=FB,LRECL=18,BLKSIZE=3600)
//DATA.FT11F001 DD DSN=ONE,LABEL=(1,SL),UNIT=(2400,,DEFER),
```

```
//    VOL=SER=BMT24,
//  DCB=(RECFM=VBS,LRECL=424,BLKSIZE=8484)
//DATA.FT11F002 DD DSN=TWO,LABEL=(1,SL),UNIT=(2400,,DEFER),
//  DCB=*.FT11F001
//DATA.FT11F003 DD DSN=THREE,LABEL=(2,SL),VOL=REF=*.FT11F001,
//  DCB=*.FT11F001
//DATA.FT11F004 DD DSN=FOUR,LABEL=(2,SL),VOL=REF=*.FT11F002,
//  DCB=*.FT11F002
//DATA.FT11F005 DD DSN=FIVE,LABEL=(3,SL),VOL=REF=*.FT11F001,
//  DCB=*.FT11F001
//DATA.FT11F006 DD DSN=SIX,LABEL=(3,SL),VOL=REF=*.FT11F002,
//  DCB=(RECFM=VBS,LRECL=84,BLKSIZE=1684)
//DATA.FT11F007 DD DSN=SEVEN,LABEL=(4,SL),VOL=REF=*.FT11F001,
//  DCB=*.FT11F001
//DATA.FT11F008 DD DSN=EIGHT,LABEL=(4,SL),VOL=REF=*.FT11F002,
//  DCB=*.FT11F002
//DATA.FT11F009 DD DSN=NINE,LABEL=(5,SL),VOL=REF=*.FT11F001,
//  DCB=*.FT11F001
//DATA.FT11F010 DD DSN=TEN,LABEL=(5,SL),VOL=REF=*.FT11F002,
//  DCB=*.FT11F002
//DATA.FT11F011 DD DSN=TONE,LABEL=(6,SL),VOL=REF=*.FT11F001,
//  DCB=*.FT11F001
//DATA.FT11F012 DD DSN=TTWO,LABEL=(6,SL),VOL=REF=*.FT11F002,
//  DCB=*.FT11F002
//DATA.FT11F013 DD DSN=TTHREE,LABEL=(7,SL),VOL=REF=*.FT11F001,
//  DCB=*.FT11F001
//DATA.FT11F014 DD DSN=TFOUR,LABEL=(7,SL),VOL=REF=*.FT11F002,
//  DCB=*.FT11F002
//DATA.FT11F015 DD DSN=TFIVE,LABEL=(8,SL),VOL=REF=*.FT11F001,
//  DCB=*.FT11F001
//DATA.FT11F016 DD DSN=TSIX,LABEL=(8,SL),VOL=REF=*.FT11F002,
//  DCB=*.FT11F002
//DATA.FT11F017 DD DSN=TSEVEN,LABEL=(9,SL),VOL=REF=*.FT11F001,
//  DCB=*.FT11F001
//DATA.FT11F018 DD DSN=TEIGHT,LABEL=(9,SL),VOL=REF=*.FT11F002,
//  DCB=*.FT11F002
//DATA.FT11F019 DD DSN=TNINE,LABEL=(10,SL),VOL=REF=*.FT11F001,
//  DCB=*.FT11F001
//DATA.FT11F020 DD DSN=TTEN,LABEL=(10,SL),VOL=REF=*.FT11F002,
//  DCB=*.FT11F002
//DATA.FT11F021 DD DSN=TTONE,LABEL=(11,SL),VOL=REF=*.FT11F001,
//  DCB=*.FT11F001
//DATA.FT11F022 DD DSN=TTTWO,LABEL=(11,SL),VOL=REF=*.FT11F002,
//  DCB=*.FT11F002
//DATA.FT08F001 DD DCB=(RECFM=FBA,LRECL=133,BLKSIZE=133),SYSOUT=A
//DATA.FT09F001 DD DCB=(RECFM=FBA,LRECL=133,BLKSIZE=133),SYSOUT=A
//DATA.FT13F001 DD DCB=(RECFM=FBA,LRECL=133,BLKSIZE=133),SYSOUT=A
//DATA.FT20F001 DD UNIT=(2400,,DEFER),DCB=(RECFM=FB,LRECL=100,
//    BLKSIZE=3300),DSN=BMT21,VOL=SER=BMT21
//DATA.INPUT DD *
```